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Medical Times

A Monthly Journal of Medicine, Surgery and the Collateral Sciences

Published by THE MEDICAL TIMES COMPANY at 95 Nassau Street

VOL. L., No. 9

NEW YORK, SEPTEMBER, 1922

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Medical Times

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Vol. L., No. 9

New York, September, 1922

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Old Age in Man

ARTHUR MACDONALD
Washington, D. C.

From the modern scientific point of view, old age may be regarded as natural and physiological as childhood, and not a pathological maturity. Bone brittleness, due to waste of organic matter and excess of lime salts is as natural, as are elastic and soft bones in childhood. Atrophy, hypertrophy and involution changes in the aged are as normal, as undeveloped organs and tissue in youth.

Physiological changes in the old appear much greater than the anatomical. Thus, physical debility, which is normal, is much greater than can be explained by waste of muscles or anatomic changes in nerves.

In maturity, anatomical and physiological conditions are definitely related, but not in advanced age. The brain reaches its maximum weight about the age of thirty, but maximum mental capacity is attained about fifty or later. Weakening of brain nutrition may lessen the power of concentration, impairing memory of recent events. Physiological changes are often mistaken for disease. Shallow breathing, high blood pressure, less urine, and change of heart sounds, these all can be normal in the old.

To maintain the equilibrium of the vital organs, avoiding excessive strain and irritation to any one of them, it is to prolong life. When these organs weaken, but each in like degree, such harmonious retrogression is necessary to long life, on the ground that the chain is never stronger than its weakest link; a disproportionately enfeebled organ endangers life. Normal or physiological death is when body and mind fade slowly but with equal cadence.

The aim of hygiene is to know how to live, and to learn how to grow old is also its purpose. Keep the aged out of bed, outdoors and active; when the wheel stops rolling, it falls. The old require sympathetic care and mental stimulus. Whether to change old but unhealthy habits is a difficult problem in the aged.

People with iron constitutions may violate all rules of health, and yet live long, but such constitutions are exceptional; thus the Jews are long-lived under most unsanitary conditions; the Bulgarians, Roumanians and Russians reach very advanced age in disregard of hy-

gienic conditions. Heredity is probably the most powerful factor in old age.

Death is seldom painful, especially in old age, where it usually occurs in unconsciousness or asleep.

Sir Walter Scott said on his deathbed: "I feel as if I were to be myself again."

Lord Chesterfield in his old age could not ride fast in his carriage, and because he had to go very slow, said: "I am now going to the rehearsal of my funeral."

Critical Periods in Old Age

There appear to be certain general but critical periods in old age. If between sixty and seventy urinary difficulties are overcome, the chances are that they will not give much further trouble. If between seventy and eighty arterial dangers are avoided, the prospects are good for much less trouble from this source. From eighty to one hundred or more, it would seem that the main danger is from some physical or mental indiscretion, which may have serious results, owing to the general debility, which though normal for extreme old age, easily succumbs to any slight shock.

The aged took care of us in our infancy, helped us in our youth and often economized and sacrificed in order to educate us, and had it been necessary, many of them would have died for us. Now that they have become old, it is no more than just to provide them with the necessities of life in their declining years.

In a study of old age it may be of interest to note comparative ages of things in general. Not only man, but animals, vegetables, minerals and even the world and universe grow old. The age of the universe we can assume to be infinite; we cannot think of a space before there is no space, nor a beginning before which there was no time.

It has been estimated that our earth can not be much less than one hundred million years old. The age of the rocks and the divisions of geologic time depend upon the law of superposition of strata, where the oldest are below and the youngest above. Thus the Archean strata are the oldest rocks, then the Muronian, Cambrian, Silur-

¹ In an article by the writer (see references) physical and psychological death are treated in detail.

ian, and so on up to the pleocene and pleistocene and more recent formations.

Ages of Organism

It has been said that every organism is potentially immortal, because every living thing comes into being as a piece of protoplasm, which is itself immortal. But living organisms are particles of protoplasm and have a limited time of existence as such.

Single-celled organisms have a short life from a few hours to a few days. In plants, duration of life, is variable; shrubs live from four to ten years; trees, as poplars and willows, live about fifty years; fruit trees longer; large trees range from three hundred years in the elm to five thousand years in the trees of California. The lives of insects are usually very short; butterflies live a year. Fish and reptiles of certain kinds reach a great age; crocodiles may live to be one hundred years old. Ages of birds vary greatly; gulls live forty years; ducks and geese fifty; parrots still longer.

The horse lives from fifteen to thirty years; cattle from twenty-five to thirty years; dogs from sixteen to eighteen years and cats may live longer. The tortoise shows no signs of age; some live for more than one hundred years; there is a case of one one hundred and fifty years old. As a rule, animals with slow rate of reproduction are longer lived than those with rapid reproduction.

Domestic fowls are said to be capable of living thirty years. The possible duration of human life is probably greater than that of any other mammal, except the large whales. The potential longevity of lions is between thirty and forty years. A raven has lived sixty-nine years; an eagle sixty-eight; while more than one parrot has been known to have been one hundred years old. As a rule, the larger the larger the animal in its group, the older it is.

Methods of Studying the Old

Investigation shows that the degree of senility cannot be measured by the age of the subject. There are two methods of scientific study of the aged; (1) The anatomical and clinical, and (2) experimental. Thus there is the inquiry into the spontaneous lesions, and, on the other hand, the lesions experimentally caused by various factors which weaken the organism and produce the senile waste precipitated by the action of time.

Experiments upon animals have produced lesions which may be considered the causes of senility. It has been shown that aortic atheroma, cirrhosis of the liver, and chronic interstitial nephritis can be caused in animals by small daily doses of paracresol continued for months. Also very pronounced organic lesions have been produced artificially, which resemble closely those found in the organs of the old. It would seem that gaseous substances, formed constantly in the intestines, act slowly like poisons capable of causing lesions met with in old age.

Comparative anatomy indicates that the duration of life in any species is five times the period required to develop the skeleton in that species. In man this period is from twenty to twenty-two years, making one hundred years about the limit. But the mortality rates are so large from sixty to sixty-five that it is at this period that old age actually begins, almost most superannuation allowances begin this time of life.

Three Phases of Old Age

We may divide old age or senile regression into three phases: first, presenility; second, old age proper, and third, decrepitude. While, of course, such a classification will overlap, making it impossible to draw sharp lines, yet considering the facts thus far obtained and the vari-

ous opinions of authorities, these three general divisions seem justified.

Early signs of arterial thickening indicate premature senility; strumous or scrofulous habit of body induces premature senility. Interstitial nephritis is easily predicted by a marked nervous irritability, or by increased emotional excitement; ossification of costal cartilages before age 60 is a premature senile indication. Prostatic enlargement before age 60 is an early sign of senility.

There are some men who grow old at the age of forty, but women not so often. Lowering of reproductive power, abnormal reaction of emotions, lessening of power of attention, concentration and memory; diminishing of initiation, imagination, confidence and enthusiasm; less adaptability, difficulty in altering the point of view and in command of speech—all these changes are normal in old age; but if they appear as early as fifty, they indicate premature senility.

Impairment of memory with periods of apathy and dullness, over irritability, attacks of giddiness from slight changes of posture as in stooping down or suddenly turning about, on closing the eyes indicate presenility. In resting the head on a pillow, the blood may feel as flowing fast from front to back of head; sudden fatigue and drowsiness the latter part of the day, and subsequently at any time followed by flights of ideas, excitement; waking early suddenly and completely, with dismal feelings, these are all signs of premature senility.

The skin becomes darker where it has been exposed much to the sun-light; it becomes loose owing to waste of connective tissue, and falls into folds, very marked where there has been a waste of fat, as in case of the neck and forehead.

The hair is gray and thin, with occasional excessive growths on the eyebrows, ears and nose of men, and upon chin and upper lip of women. The sexes approach each other in physiognomy.

As far as investigation has gone, it would appear that in tissue waste and repair, the newer cells differ from the earlier ones, that in advanced age, none of the earlier cells are left, except the brain cells, which are the only connecting link between the child and man; it is believed that the brain cells do not regenerate themselves, that such cells were present at birth, though altered in structure, and possibly in composition. There is the same personality, continuity of activity is maintained, anatomical changes normal to old age are neither uniform nor regular until the last stages of aging arrive.

Bones gaining in weight and size up to maturity in approaching old age gradually lose weight but do not usually diminish in size, but may increase through super-ossification; sharp outlines of the aged are in part due to this.

Irregular waste changes shape of bones. Cranial bones become thin and the suture obliterated. The pronounced changes in the lower maxilla result in the weakened physiognomy of old age. In some cases the cranium increases in thickness, most marked in the frontal region, according with the fact that the shrinking is greatest in the frontal lobes of the brain.

If the cartilage becomes thinner (not infrequent about 60), it is an ill omen for the future. Humphrey regards the calcification of cartilage and of the arteries as pathological, changes and not normal, for in the great majority of persons over 80, calcification is not found and the arteries appear to be in a healthy condition.

Looking at old age in its extreme type or forms called decrepitude, it displeases our aesthetical sense. The dependence of childhood causes sympathy, but the disagreeable facial aspects of some of the aged and their eco-

nomic worthlessness make them liable to suffer from neglect. The extreme types are self-centered, their faces are without expression, suggesting mental weakness; they are morose and helpless, or anxious. The skin is dry, without luster, darker than formerly, often pigmented loose and thin, with varicosed veins and tortuous arteries underneath. The nails are brittle and frequently cracked; the lips are usually cyanosed, due to impaired circulation and breathing; there may be passive hyperemia over the molars and tip of nose. Waste of muscles vary according to their activity; thus in actors, the muscles waste in bulk; where not much employed, the muscles waste late.

There is atrophy of the lower jaws, showing a weak chin, suggesting lack of energy. Such atrophy includes loss of teeth. The eyes are without luster and show a grey ring around the cornea; there is an occasional ptosis of the upper lids. Stature is diminished by compression of the intervertebral discs; there is increase in spinal curvature, flattening of pelvis, depression of neck, of femur and generally broken down arches; also the head droops, due to weakness and waste of muscle; the knees bend, due to effort to maintain equilibrium. The walk is halting, with slow, short and uncertain steps.

Physiological Changes in Old Age

The earliest physiological changes are less activity, less power and less vital resistance to untoward conditions. Next to kidney proliferation, arterio sclerosis and cardiac hypertrophy, the earliest changes occur in the lungs, where until after the limit of growth has been reached, the amount of air is lessened. Lung capacity is diminished at the rate of about $1\frac{1}{2}$ cubic inches per annum.

Marked physiological changes consists of altered activity, and loss of harmonious interrelation between associated functions; circulation, due to loss of elasticity of vessels, is with difficulty maintained. The compensatory increased heart activity is expended in the larger vessels. The atrophy of the muscular fibers of the veins dilates them, and the return circulation is impaired.

The urine shows little alteration in composition, though the senile kidney is much changed. Micturition is slower. The amount of urine is diminished, and is less in specific gravity.

Coordination is less, afferent and efferent impulses are slower; there is weakened if not perverted sensibility. There may be anatomical changes without functional changes, as in the case of Bunsen doing original research up to time of his death at 89; yet his brain was greatly atrophied. Tendon reflexes are generally diminished; the knee reflex being absent in 20 per cent, arm reflex in 71 per cent, and foot reflex in 81 per cent of persons between 65 and 85 years of age.

Farsightedness is common and with myopia in earlier life, this flattening of the crystalline lens may reduce the former excessive convexity to such an extent, as to make it possible to see well without glasses, producing so-called "second sight." Deafness is usually present in old age, and in not a few cases it is complete. Smell is generally weakened and often obliterated, and sometimes perverted. Taste is blunted and occasionally perverted. The aged generally feel cold, due to less surface circulation and impairment of heat regulation; less skin sensitivity is due to the mind failing to note skin sensations.

Duration of life depends not only on inherited constitution, but on innumerable chance elements of surroundings. The environment of two brothers is liable to be much more alike than that of father and son, for many things change from generation to generation; yet even in the case of brothers one may remain at home and the other destroy his health in some distant country.

As the heart sends less blood to the lungs, these two organs become more harmonious and shortness of breath ceases. This method of compensatory degeneration of the organs, tending to a general equilibrium, prolongs life. Such readjustment is illustrated in the loss of teeth causing changes in diet and digestion and in taste of certain kinds of food. Thus insipid kinds of food become distasteful; these are generally alkaline and indigestible; there is usually a dislike of fat and at the same time the secretion of bile is diminished; acids are relished and aid in senile constipation. Appetite lessens, causing longer intervals between meals, preventing the addition of food to undigested food already in the stomach. Food in the form of mush, or liquid is desired, which lessens constipation. This compensatory tendency to equilibrium of the vital organs, avoids excessive strain and irritation in each of them and produces, as we have seen, harmonious interrelations and symmetrical weakening so that life can be prolonged until death becomes natural or normal.

Diseases in Old Age

The aged are especially prone to gout and rheumatism and quite susceptible to erysipelas. Influenza tends to cause marked prostration, organic weakness and frequent heart failure. Arteriosclerosis often causes rupture of arteries, and apoplexy from cerebral hemorrhage.

They may also be frequent bronchitis, which when prolonged may be followed by emphysema. In digestive or infective disorders of the urinary tract (usually inflammation of the bladder), fever may arise, and respiratory failures become dangerous.

Diseases in old age form vicious circles which may involve every function. The most pernicious circle after the limit of compensatory heart hypertrophy is reached, is slower circulation, resulting in less nutrition to the heart itself, which in turn weakens the heart still further.

Pain is often absent in diseases in which in maturity it is a prominent symptom; thus its absence in pneumonia, gastritis, peritonitis, etc., may lead to a wrong diagnosis, and neglect of disease until patient dies. Gangrene seldom gives pain. Absence of pain in senile diseases is associated with mental weakness, as well as the condition of the nerve terminals. Vomiting is infrequent in diseases, where in maturity it often occurs.

Death from disease in old age is rarely due to the primary disease, but to involvement of vital organs or to general physical exhaustion, or exhaustion with heart paralysis. Indicent complications which are not connected with the primary disease, are rarely avoidable or curable, for they are caused by the efforts of correlated organs to keep in harmony with the diseased organs; these efforts increase or prevent the functions of the secondary organs, and hasten their own degeneration. Thus in the pneumonia of old age, the increased activity of the heart rapidly exhausts it. Prognosis depends much upon what further strain the correlated organs can stand. Organs well preserved up to the age of 80 or 85, may rapidly degenerate and become diseased, so that death results from disease in organs previously in apparent health; this has been observed especially in the case of the heart which may have held out, and its power to compensate for the effects of arteriosclerosis fails at this time, there may be rapid whitening of the hair, which had retained its color.

A fracture of the neck of the femur is a frequent cause of death in old age, as was the case of the distinguished pathologist Virchow.

Whether apparent or not, hardening of the arteries is probably present in the great majority of cases of old age. A frequent cause of death is the senile kidney.

its tissues being altered and its power to function being lessened; the kidney may eliminate the decreased excretory substances coming from a lower vitality, but it may not be able to perform the added task occasioned by indigestion or ailment accompanied by fever. It is said that the changes of texture, which old age impresses upon the organism at times, are so strong that the physiological and pathological states are difficult to distinguish because of the insensible transitions.

Diseases in old age are pathologic conditions in a normally degenerating body, not like diseases in maturity accompanied by degenerations. The general treatment in old age is to restore the diseased organ or tissue to a state normal in senility, but not to a condition normal in maturity.

In extreme old age the individual feels himself becoming weaker from day to day; his legs do not obey his will, his skin is insensitive dry and cold, face thin, eyes weak and hollow, speech ceases out of his mouth, which continues open; breathing is difficult and finally the old person passes away quietly, as it were, falling asleep. This may be called natural death.

In death from old age, life begins to cease in all parts and then in the heart. Death is usually from circumference to centre, but in sudden death life stops in the heart and then in all the parts, that is, from the centre to the circumference.

Death is too frequently ascribed to old age, as if it were a disease, which it is not. Old age is very rarely a cause of death; when it does occur, however, or there is a gradual and proportionate degeneration of all the vital organs until their functions are more and more impaired reaching extinction. Death from old age is much less frequent than statistics indicate, for it is often due to disease, not recognized by the physician.

Normal Mental Regression of Old Age

Most mental powers wane with agedness, but there are some which improve; thus memory weakens early, yet many can recall distant events in their lives, forgotten for many years; this usually is not due to any conscious effort. Names are generally forgotten first, especially of distant acquaintances; dates are the next to be forgotten; thus a civil war veteran could not say whether he was married before or after the war.

After the thirtieth to thirty-fifth year, when the brain has reached its maximum growth, it is more difficult to retain new impressions until in old age it requires much effort. Prolonged or concentrated attention causes brain fag in the aged. After the fiftieth year, it becomes more and more difficult to remember recent names, dates or events. If this impairment be so great that events just pass be forgotten, such a condition is senile dementia.

But the powers of reason seem to increase for twenty or even thirty years after the brain has reached its maximum growth. While the quality of reasoning is not impaired, the quantity, or power to continue without intermission is lessened. The sleep of the old deacon in church in the midst of the sermon is due to concentration of attention, and not the sermon; if he tries to keep awake, he may forget the early part of the discourse.

New ideas may not come to the mind as readily as formerly; choice of words must be debated, more corrections are necessary. In reading the idea is not grasped as easily as in maturity, so that a paragraph must be read several times to be comprehended. It is more difficult to concentrate attention. Formerly a single reading gave a clear idea to be reproduced at will; now such impression may soon fade. Interest in general affairs may lessen, though in a specialty or hobby, the interest may be not impaired and may be

even increased, as interest in general matters wanes. Thus an aged person may manifest even greater mental capacity than before when confined to one direction, though the total capacity for work be less. This teaches the value of mental economy, and explains remarkable mental productions in old age.

In general mental deterioration, the intellect, will, sensation and emotion may become less and less active until complete dementia arrives. The change in temperament or disposition may be normal, since it comes from the realization of advancing age, less power and opportunity, increasing discomfort and approachin death.

Centenarians

So long as functions work easily the centenarian desires to live, but when weariness and lassitude come and communication with others is ceasing, he may be content to quit life; and when the body is full of pain and distress which rarely happens, he may be even anxious to die. Though capacity for work may be passing away, the centenarian may reflect with contentment upon the past with sereness and with leniency towards the faults of others.

In the great majority of centenarians, there is no evidence of rheumatic or gouty affection in the joints of the fingers, a condition often regarded as a sign of coming old age.

Centenarians have very few teeth as a rule. The majority have good sight; many use glasses. The average pulse is 70 and average respiration is 22. Average duration of sleep is nine hours, which tends to delay the downward course of the body. Troubles of the centenarians consist mainly in weakness. Mental or bodily effort of any kind soon causes fatigue; sometimes resulting in tremor of the limbs; in case of the upper limbs there is difficulty in making a straight line, which causes the smallness of handwriting in some old people. Brain weakness results in bad memory, slow apprehension, and little power of concentration, so that there is disposition to wander from one subject to another. The brain in some, however, holds out better than the other organs. The failing of strength is generally about equal in all organs. Bronchitic and pneumonic troubles appear no more frequent than in those less advanced in years. The heart is regular in action, pulse small and no evidence of arterial degeneration; they seem to outlive prostatic and other urinary troubles.

In the United States in 1910, the ratio of the sexes under one year was 1000 females to 1026 males. There were living 3,555 centenarians, of whom only 1,380 were men and 2175 women; it must be noted also that in the whole population there were 2,692,288 more males than females. The experience of insurance companies show highly vitality also for women. It would seem that women are much freer from the many bad habits of men, especially in the use of alcohol and tobacco. It appears to be shown that tobacco affects the heart and vascular system and shortens life. The fact that a few drunkards and habitual smokers live to an advanced age are the exceptions which prove the rule.

Conclusions from Returns of Four Hundred Physicians on Eight Hundred Persons Eighty or More Years Old

About the year 1888, some four hundred physicians of the British Medical Association made reports on cases of aged persons under their care. As this is the only investigation of a first-hand character upon eight hundred aged people eighty years of age or more, it will be well worth while to examine the returns of this large number of physicians somewhat in detail, as given in tables. While these tables are based upon the results

obtained and reported by the physicians (not in tabular form), the author has worked them out in his own way and is wholly responsible for them.

Table 1 is given in percentages and refers to the present condition of the aged. Table 2 deals with their lives before arriving at old age.

Beginning with the first three columns of table 1, it will be seen that as to their figure or build, aged persons are much more average and spare in build, rather than stout. As to weight and height, there is little difference between those in

In intellect the aged increase in dullness. Reports as to their previous lives (see table 2) show a higher per cent of brightness and much lower per cent of dullness. Memory was good in ?? per cent and best (77 per cent) in the centenarians.

Comparing the sexes, it will be noted that in the nineties and especially among the centenarians (more than double in number), the women greatly predominate, due probably to their more regular and more moral lives.

In respect to the joints, stiffness and deformities increase with age. Signs of failing are highest in the heart with centenarians, but in lungs, urinary organs and brain the signs are more frequent in the eighties and nineties. Teeth average from 3 to 5, and those with none are most numerous with the centenarians.

Defective hearing increases with age and sight fails most among the nineties and centenarians.

¹ See Humphrey in references at end of article.

¹ The writer has shown the same to be true in children, see his, "Experimental Study of Children". Report of Commissioner of Education Jan. 1898-99.

TABLE I—PRESENT CONDITION OF THE AGED
Figure Posture Arteries

In table 2 will be found details as to the previous lives of these aged persons. The centenarians married the earliest, at the average age of 24. In all ages the average number of children was from 6 to 7 per family. As to temperament, the centenarians appear to be the most placid and least energetic. In social condition the largest per cent were comfortable, with less, but still large, per cent poor. The great majority (73 to 79 per cent) became bald late. The majority (65 to 68 per cent) were average eaters, with the remaining about equally divided between large and small eaters. The majority (59 to 67 per cent) were outdoors a good deal. A large number (87 to 89 per cent) were good sleepers, very few (3 per cent) were bad sleepers and none among the centenarians. As to alcohol, the great majority use it little or moderately; 50 per cent of the centenarians had never used it at all. Good digestion and appetite prevailed in from 91 to 98 per cent. The great majority used animal food little or moderately. These aged people averaged 8 hours sleep daily; and arose at 6 in the morning. Seventy per cent of the centenarians had never smoked.

TABLE 2—CONDITION OF THE AGED DURING THEIR PREVIOUS LIFE.

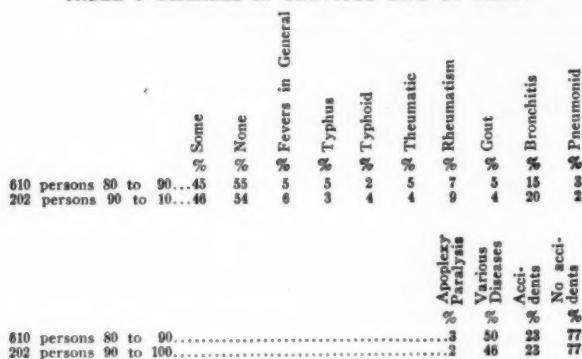
		LIFE.			Intellect		Out Doors		Sleeper		Alcohol Use		
		80	to	90	80	to	90	80	to	90	80	to	90
610	persons	80	to	90	.....	28	av.	Age	Married	.....	.....	.....	.....
202	persons	90	to	100	.....	30	av.	5	15 %	No Children	.....	.....	.....
52	centenarians	.....	.....	.....	24	av.	6	15 %	Children	.....	.....	.....	.....
					24	av.	9	15 %	Placid	.....	.....	.....	.....
					24	av.	10	35 %	Irritable	.....	.....	.....	.....
					24	av.	12	33 %	Energetic	.....	.....	.....	.....
					24	av.	12	33 %	Affluent	.....	.....	.....	.....
					24	av.	12	33 %	Comfortable	.....	.....	.....	.....
					24	av.	12	33 %	Poor	.....	.....	.....	.....
					24	av.	12	33 %	Early	.....	.....	.....	.....
					24	av.	12	33 %	Late	.....	.....	.....	.....
610	persons	80	to	90	.....	28	av.	2	15 %	None	.....	.....	.....
202	persons	90	to	100	.....	30	av.	6	15 %	Large	.....	.....	.....
52	centenarians	.....	.....	.....	24	av.	6	15 %	Small	.....	.....	.....	.....
					24	av.	6	15 %	Average	.....	.....	.....	.....
					24	av.	6	15 %	Much	.....	.....	.....	.....
					24	av.	6	15 %	Bad	.....	.....	.....	.....
					24	av.	6	15 %	Good	.....	.....	.....	.....
					24	av.	6	15 %	Average	.....	.....	.....	.....
					24	av.	6	15 %	Good	.....	.....	.....	.....
					24	av.	6	15 %	Much	.....	.....	.....	.....
					24	av.	6	15 %	None	.....	.....	.....	.....
					24	av.	6	15 %	None	.....	.....	.....	.....
					24	av.	6	15 %	Little	.....	.....	.....	.....
					24	av.	6	15 %	Large	.....	.....	.....	.....
					24	av.	6	15 %	Small	.....	.....	.....	.....
					24	av.	6	15 %	Much	.....	.....	.....	.....

TABLE 3—DISEASES IN PRESENT CONDITION.

610 persons	80	to	90.	.....	\$ 7.90	Some Diseases
202 persons	90	to	100.	.....	\$ 2.25	No Diseases
					\$ 1.25	Bronchitis
					\$ 1.25	Heart Trouble
					\$ 1.25	Rheumatism
					\$ 1.25	General Debility
					\$ 1.25	Various Ailments

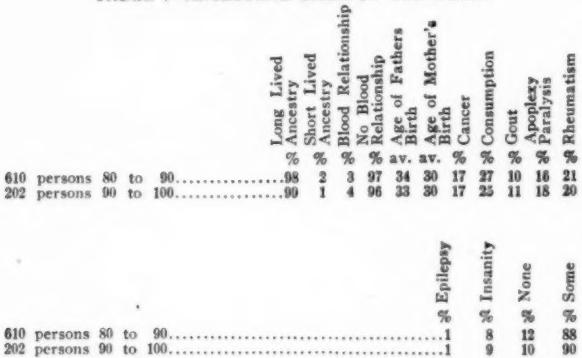
Table 3 shows the present status of the aged as to diseases. In general there is only a difference of 7 per cent between those in the eighties and nineties. There, however, is more bronchitis, heart disease and rheumatism in the eighties, but more general debility in the nineties.

TABLE 4—DISEASES IN PREVIOUS LIFE OF AGED.



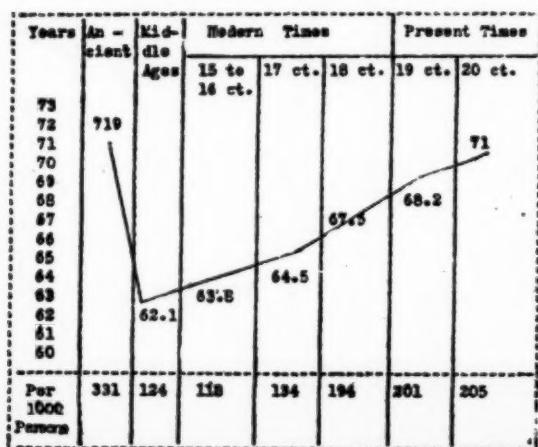
Diseases in the previous life of the aged are given in table 4. The morbidity, on account of disease, is practically the same in the eighties and nineties, which has just been shown true for present condition (table 3). In special diseases there is no marked difference except in bronchitis which is five per cent higher in the nineties.

TABLE 5—ANCESTRAL DATA OF THE AGED.



In examining table 5 for ancestral data, it will be seen that almost (98 per cent) all parents were long-lived, pointing to the great influence of heredity. There is little (3 to 4 per cent) blood relationship in their ancestry. Average age of parents at birth of the aged is 33 for father and 30 for mother, indicating relatively late marriage. Freedom from disease is distinctly least in the ancestry (compare tables 3 and 4).

Ages of Historical Personages



This diagram shows that since the middle ages among historical personages, there has been an increase of nine years in the average duration of life of persons from 62 to 72 years of age, but a decrease from ancient times to the middle ages.

TABLE 6—HISTORICAL PERSONAGES

Periods of Time Geographical position, Profession	Per cent reach- ing age 60	Per cent reach- ing age 80
Ancient times	76	33
Middle ages	60	12
<i>Modern Times:</i>		
15th to 16th Century	58	12
17th Century	65	13
18th Century	72	19
19th Century	76	20
20th Century (1900-1910)	81	25
France	74	20
Central Europe	70	17
Northern Europe	67	15
Southern Europe	68	16
Sovereigns and Princes	44	7
Statesmen	69	23
Men of Letters	71	19
Scientists	78	21
Military Men	73	21
Clergymen	77	23
Artists	72	17

Table 6 shows the percentages (omitting all deaths from violence) of historical personages who reached the ages of 60 and 80 for different periods of time, also according to geographical position and occupation or profession.

It will be noted that the proportion of distinguished persons reaching the age of 60 is the same for ancient times and the 19th century (76 per cent), but less than the first ten years of the 20th century (81 per cent). But in the case of those reaching the age of 80, the ancients show much the highest per cent (33).

Since the middle ages (excepting the 15th and 16th centuries), there has been a continuous increase of those reaching either ages 60 or 80.

In respect to geographical position, it will be seen that Central Europe (including France) leads in percentage of aged persons as compared with Northern and Southern Europe.

As regards profession or occupation, given in the third part of table, the very low per cent of sovereigns and princes reaching old age will be noted. This is due probably to more irregularities and vicissitudes experienced in life. On the other hand, the clergymen and scientists live the longest owing perhaps to the power of religion in one case, and to a quiet, regular and rational life in the other.

TABLE 7—AVERAGE WEIGHTS OF BODY AND INTERNAL ORGANS

Number	Weight Lbs.	Height Ft.	Encephalon ex. oz.	Right Lung oz.	Left Lung oz.	Heart oz.	Stomach contents oz.	Liver oz.	Spleen oz.	Kidneys oz.	Pancreas oz.
Men, 30 to 40.....	103	56	48	28	24	11	6	55	7	11	8
Men, 30 or more....	24	59	56	45	30	12	6	41	4	10	8
Women, 30 to 40....	83	57	52	43	19	9	6	54	6	8	6
Women, 30 or more..	75	50	50	40	15	10	6	53	3	7	5

It will be seen from table 7 that in persons more than 80 years of age the height and weight are nearly the same as in maturity, except in women where there is a distinct diminution of weight of seven lbs. The cerebral and abdominal organs have wasted, while the lungs have gained in weight in men, but not in women.

The heart has increased in both sexes, and the liver, spleen and kidneys greatly decreased in weight. It will be noted that the aged women in number are much larger than the aged men.

From a medico-accurial table of heights and weights of 221,819 men and 136,504 women, it was found that the highest death rate is among persons 50 to 80 pounds over the average weight at 40 to 45. The lowest death rate is found among those 25 to 45 lbs. under the average weight at ages 57 to 62.

Longevity Is Retrograding in the U. S.

TABLE 8—DEATH RATES PER 100,000
MALES IN UNITED STATES
(United States Census Report)

Ages	1890	1900	1910
12.....	331	276	237
22.....	864	699	558
32.....	1065	869	771
42.....	1358	1154	1147
52.....	1961	1655	1807
62.....	3277	3330	3641
72.....	6172	7046	7643
82.....	13893	15860	15234
92.....	23384	30859	25527

In the United States, table 8 shows for men (practically the same for women) decrease before the age of 52, but that is general death increased after age 52 from 1890 to 1910, except for ages 82 and 92 in decade 1900 to 1910. The important fact brought out is that before the age of 52 death rates have decreased and after 52 it has increased. In short longevity is retrograding in the United States.

Ages of Professional Persons

TABLE 9

Professional Persons	Number	Aver. Age
Musicians	30	62
Novelists	26	63
Poets	46	66
Painters and Sculptors	39	66
Religionists	22	66
Men of letters	40	67
Agitators	14	69
Comedians	45	71
Statesmen	112	71
Scientists, inventors	58	72
Historians	38	73

Table 9 shows the average age of distinguished professional persons presented in ascending order, where the musicians, novelists, poets, painters, etc., with average ages of 62 to 66, are seen to have shorter lives than the comedians, statesmen, scientists and historians, with average ages of 71 to 73.

Table 10 shows for England and Wales that the relative number of aged people have increased since 1871 to 1910, while in the United States the reverse is the case, as already noted.

The second part of the table gives the death rates for diseases for males in the order of their frequency, as

follows: organic heart disease, 11.75; bronchitis, 9.48; cancer, 7.96; pneumonia, 3.21, and nephritis 3.08 in those 65 years of age and more. Scotland also shows practically similar results in its official returns for diseases.

Genealogical Heredity

In a study of the Hyde genealogy involving 8,797 persons, it was found that a tendency to longevity was an inheritable characteristic which probably consists in a strong constitution, and through the superior fecundity of the long lived, tends to improve the vigor and vitality of coming generations.

Where neither parent lived to be 80, about 5 per cent of the known offspring lived to be 80 or older; where one parent but not the other lived to be 80 or more, about 10 per cent of the known offspring lived to be 80 or older, and where both parents lived to be eighty or more, about 20 per cent of the known offspring lived to be 80 or more. Thus the attainment of old age is significant; for the last survivors of a generation are those who have resisted disease best. This immunity power is inherited, and through the superior fecundity of the long lived is distributed very generally in the population.

Results of Study of Nine Centenarians

As a result of the study of nine centenarians (7 women and 2 men), respiration was found to be normal, the chest expanding regularly and fully similar to persons in the prime of life. The voice was generally good. A silvery expression, with apparently great toughness of skin may be an essential peculiarity of person over 90. All of the six centenarians had fairly good teeth except one.

Circulation, respiration and digestion were good in six. Sight was also good, smell fairly good, but hearing was impaired. The mental faculties were active and not impaired. These six centenarians show an entire absence of those changes unusually observed in persons 70 to 80. Some centenarians seem tired of life, for they feel isolated.

This table (11) gives the average ages of modern distinguished men at the (1) beginning and (2) zenith of their mental activity, with (3) the average duration of such activity.

It will be seen that the average initial age is 24 for the 374 men under consideration in table. The actors at age 18 and the musical composers at 17 are the earliest in beginning their mental development. Warriors, artists, clergymen and jurists show an initial age of 22; these with dramatists and playwrights at age 23, are below the average. Poets, chemists, physicists, inventors, physicians and surgeons show an average at age 24. The satirists and humorists develop the latest, at an initial age of 32. Reformers at 28, philosophers at 27 and essayists, historians, novelists, statesmen and explorers at 26, with naturalists at 25, are all above the average.

TABLE 10

England and Wales Years	Death of Persons per 1,000 living at ages						Disease (1911) Causes (Males)	Ages					
	0	10	55	65	75	85		0 to 1	5—	15—	25—	45—	65—
1838—1911	61.0	3.8	30.2	63.1	137.7	287.8	Influenza	0.27	0.019	0.040	0.080	0.240	0.89
1841—50	66.0	5.3	29.9	63.6	141.5	301.0	Pulmonary Tuberculosis ..	0.48	0.173	1.080	1.922	2.254	1.19
1851—60	67.6	5.0	28.9	61.7	139.9	296.5	Cancer	0.03	0.025	0.049	0.250	2.702	7.96
1861—70	68.6	4.5	30.4	62.8	140.4	296.6	Organic Heart Disease ..	0.02	0.113	0.204	0.480	2.778	11.75
1871—80	63.4	3.7	31.6	65.0	142.2	308.3	Bronchitis	7.09	0.034	0.020	0.113	1.340	9.84
1881—90	56.8	3.0	31.4	65.0	137.6	284.0	Pneumonia	11.12	0.209	0.274	0.631	1.507	3.21
1891—1900	57.7	2.5	31.5	65.0	137.2	270.8	Erysipelas	0.14	0.003	0.008	0.013	0.055	0.19
1901—1910	46.0	2.1	28.1	58.8	127.2	260.8	Nephritis	0.16	0.054	0.074	0.235	1.161	3.08

TABLE 11—AVERAGE AGES OF MENTAL ACTIVITY

Modern Distinguished Men	Number	At beginning of activity	Average height of mental activity	Average duration of activity
Astronomers & mathematicians.	13	26	56	47
Clergymen	15	22	50	43
Dramatists and playwrights	8	23	44	35
Essayists	28	26	51	40
Historians	23	26	57	43
Jurists	2	22	58	44
Naturalists	19	25	58	45
Novelists	39	26	46	35
Philosophers	23	27	54	37
Poets	37	24	44	33
Reformers	15	28	51	35
Statists and Cimorists	6	32	56	33
Statesmen	36	26	52	38
*	*	*		
Actors	9	18	48	42
Artists	33	22	50	42
Chemists and physicists	9	24	41	37
Explorers	15	26	47	35
Inventors	4	24	44	49
Musical Composers	20	17	48	41
Physicians and surgeons	8	24	52	46
Warriors	12	22	47	37
General Averages	374	24	50	40

TABLE 12—AVERAGE AGES OF MENTAL ACTIVITIES

Distinguished Women of Modern Times	Number	At beginning of activity	Average height of mental activity	Average duration of activity
Actress and vocalists	62	15	36	41
Artists and sculptors	13	16	33	45
Editors and journalists	4	30	59	43
Educators	11	..	..	..
Essayists	29	23	45	40
Explorers	7	21	47	31
Historians	10	31	53	37
Juvenile story writers	20	27	44	35
Literateurs	9	27	42	42
Musicians and composers	4	17	41	44
Novelists	80	22	41	36
Nurses	3	22	47	50
Philanthropists and social reformers	30	23	45	46
Physicians	3	19	45	47
Poetesses	47	21	42	37
Religionists	13	25	42	38
Scientists	11	19	48	49
Stateswomen	36	21	39	30
Translators	8	26	51	43
General Averages	400	22	45	41

Comparing table 12 for women with table 11 for men, just considered, one finds similarities and contrasts. There are 29 women essayists and 28 men, 47 poetesses and 47 poets, 13 women religionists and 15 men clergymen, 6 women physicians and nurses, and 8 men.

Splenectomy in Banti's Disease

David Fisher says that after splenectomy, there is a loss of iron from the body, which would lead one to believe that the spleen functionates in some manner in the regulation of metabolism either in iron conservation lost in blood destruction, or in the manufacture of haemoglobin, or in the formation of the red blood cells. Changes following removal of the spleen for chronic conditions are less marked than those resulting from removal of apparently healthy spleens due to acute conditions, as traumatic rupture, probably due to the fact that in chronic cases compensation for lost splenic function is gradually being built up, so that further changes after splenectomy are less noticeable. The chief changes are enlargement, temporarily, of the lymph glands, development of new haemolymph nodes, secondary anemia, leucocytosis, relative lymphocytosis, and late eosinophilia.

As to what really constitutes a cure, is indeed a moot question. Cushing's case is perhaps the most famous, being at the same time the first case in this country ever splenectomized for Banti's disease, and likewise the longest lived. The patient is still alive

On the other hand, there are 62 actresses and vocalists and only 9 actors; and 8 dramatists making 17 in all. There are 4 women musicians and composers to 20 men, 11 women in science and 41 men; 80 women novelists to 39 men.

The average age for women in beginning of mental activity is 22, being two years earlier than for men. Comparing these two tables as a whole they show a general similarity.

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after 23 years, and occasionally has an attack of hematemesis, but seems to be free from ascites. In spite of this splendid result, Cushing himself is not so sure as to how much relief he gave the patient, and advises caution in judging the ultimate results of splenectomy.

Banti's disease, although it has periods of quiescence, will eventually terminate in death, usually due to intercurrent hematemesis. What splenectomy really does for the patient is conjecture only, the feeling of W. J. Mayo in the matter being that removal of the spleen not only cuts off a possible supply of toxic material from the general circulation, but also reduces the portal circulation about 25 per cent, and the ultimate result of the operation depends upon whether or not the liver has sufficient cells to carry on its function.

Hence, after all is said and done, to ascertain actually how beneficial splenectomy really is in these conditions, it is absolutely necessary that every case so diagnosed should be reported in great detail, that others may deduce how much stress to place upon this procedure.—(Surg. Gyn. & Obst., Aug., 1922.)

Vaso-ligation or the Steinach Method of Rejuvenation

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It has been my privilege during the last several years to become vitally interested in the process of rejuvenation, especially surgical rejuvenation by gland implantation and the Steinach method of vaso-ligation.

Up to the writing of this paper I have performed over forty odd implantations, and eighteen vaso-ligatures: so consequently feel that I may discuss the matter not from a theoretical standpoint but from actual application and practice.

From time immemorial medical alchemists have sought a mythical "elixir vitae," or as Ponce de Leon visionized, a fountain of youth. To Prof. Eugene Steinach of the University of Vienna belongs the credit of personally giving to the scientific world the first valuable therapeutic process by which age may be robbed of its terrors, and the grim reaper forced to wait beyond the traditional three score years and ten by homo-stimulating automatically the organism, without the use of a graft or implanting of foreign tissue.

To Prof. Steinach and his confrere, Peter Schmidt of Berlin, I am indebted for their interest in my work on this side of the Atlantic, and were it not for their liberal co-operation in giving to me all data accumulated in their research I should be sadly lacking in the many valuable scientific principles they have set forth.

It was in 1920 that Steinach first brought to our attention the fact that the testicle was not only a sperm forming body, but that it contained definite cells which delivered to the organism an internal secretion or hormone, which was of absolute importance and necessity for the formation and integrity of the secondary sex characteristics. The ovary of the female likewise manifests secondary or selective sex action.

To this portion of the gland exercising internal secretory power, Steinach applies the term "Puberty gland" and considers it separate and apart from the testicular function and tissue proper. In other words he maintains that spermatogenesis is in no way related to the functions of the puberty tissue, which latter contains the interstitial secretory tissue, with the cells of Leydig and perhaps in combination with the cells of Sertoli.

Thus the puberty cells determine specifically sex. Pre-pubical castrated male guinea pigs with transplanted ovaries assume secondary female characteristics, and are able to nourish young from well-filled breasts. Females with transplanted testicles change somatically and psychosexually, the clitoris growing as a penis, and the sexual impulse becoming as a male. A somatical and psychosexual hermaphroditism being obtained by simultaneous implantation of testicles and ovaries. Doubtless you are familiar with my work on this subject of the transplantation of glands, and owing to the short time I have been allotted I shall not deal with the matter further.

Literally the Steinach hypothesis is built or based on the puberty gland capacity for endocrine function. In other words, "A man is as old; or as healthy as his puberty gland." The same law is true in the female in regard to the ovary.

This internal secretion or hormone contains that chemo-dynamic power that not only determines sex, but the degree of robustness of that sex, mentally as well as physically. It is the keystone of the endocrine arch, and I feel that even Sajous recognizes this fact in spite of his declaration some years ago that the thyroid was the most important link in the ductless gland chain.

The hyper or hypo secretion of the puberty gland determining the sex, health, strength, stature, and character of the individual.

Not unlike the other internal secretary glands, the puberty gland has a definite inter-relationship by virtue of its endocrine activities with the other ductless glands of the body, and by virtue of this inter-relationship or association a cycle is established which controls the delicate mechanism of metabolism.

Its secretion is a potent nervous and muscular activator. Again it stimulates oxidation to an amazing degree, thereby lessening the toxemia of lethargy. On the other hand, hypo-gonadism is generally accompanied by hypothyroidism, whether in the male or female. Cretins do not develop sexually. Further in conditions of cell lethargy and senility as well as in hypo-gonadal conditions, hypo-thyroidism accompanies. It is also well known that the anterior or glandular lobe of the pituitary exerts a gonad stimulating effect. It is but necessary to recall the adiposo-genital dystrophy of hypo-pituitarism where sexual function is lost and atrophy of the sex organs is a pathognomonic finding.

Hypo-gonadism (relating specifically to puberty gland inertia) with its train of senile symptoms and complications in the form of the diseases of obscure origin and chronic ailments, are amenable to the stimulation of vaso-ligation, in age as well as in the young adult. The fundamental principle of stimulation holding good in proportion to the responsiveness of the reaction of the glands actively stimulated, and the co-operation manifested by the other members of the ductless gland cycle.

By depriving an individual entirely of the secretion of the puberty gland by total castration, the result of my remarks becomes evident . . . I refer to the eunuch. As a rule they are tall because of the abnormal length of their tibias. Their faces are glabrous and livid, and their hanging cheeks make them look like old men. Most of them are fat with rounded outline, and in many cases voluminous breasts. Their flesh is flabby and their muscular development curtailed. In short a physical decline seems to have stricken every organ, and one is confronted with fallen, languishing creatures, whose vitality has been sapped in every respect. Their intellectual and moral failing away is no less marked.

My work on this subject leads me to believe that many debilitated men who suffer from no definite pathological condition, but manifest the stigma of approaching age or senility itself, are nothing more or less than physiologic castrates. This is doubly true in many men past the age of sixty-five. When their puberty glands cease to function, when they have lost their ardors of affection, a characteristic modification of their physical, moral and intellectual condition takes place, which their families and friends are quick to note.

How right was Metchnikoff in saying . . . "A man of genius loses much when he has lost his sex function" . . .

If Goethe, that universal genius, produced admirable works to the end of his days, if, at the same time he evinced an astonishing degree of physical activity and energy, even during the last years of his long life, it was because he was able to fall madly in love with a young girl at the age of nineteen, at the age of seventy-

four, and dying at eighty, bid adieu to the world with these words: "See what a charming woman's head that is with black curls against a black background." This great genius was a great lover, like Maupassant, like Victor Hugo, like all great geniuses.

The case of Goethe, the genius at any rate, is that all men reaching a very advanced age, continue to show themselves sturdily active, mentally clear, full of affection and generous feelings. Their puberty glands still retain a sufficient number of active cells to nourish their love of life, in contrast to the old men, whose puberty glands have atrophied.

Although we have proven beyond the question of a doubt that the internal secretion of the testicle is independent of the spermatogenic sequence, I believe as do a few others that a cessation of the functional capacity of the individual is the predecessor of senility, followed shortly by a puberty gland inertia, with the well known senile or pre-senile degenerations. In an endeavor to check up my belief, my assistant, Dr. McLeay, investigated fifty business men in order that we might ascertain what relation testicular action had on the mental and physical condition. Our results were published last year. All men in the series were between the ages of fifty and sixty. The following results were obtained.

Sixty-two per cent. were sexually active. Of this sixty-two per cent., twenty-eight were working hard from eight to twelve hours daily, all being managers and owners of large business. They stated their endurance was as good as ever, and that their general health was excellent. The remaining three men of the sixty-two per cent. were the victims of a chronic ailment, and did not actively engage in business.

The remaining thirty-eight per cent. were suffering from a waning or lost sex function. Of this thirty-eight per cent., eleven had ceased active business due to indisposition, while the remaining eight candidly admitted the fact that they were unable to visit their offices daily on account of various functional ailments, such as insomnia—lack of concentration—nervousness—asthenia—fatigue tremors, etc.

The eunuch also demonstrates that the testicle does manufacture a hormone necessary to a healthful vibrant existence. All their organs are absolutely identical with our own, only one is missing, yet the fact that they have been deprived of this one organ lowers and enfeebles the function of all the rest.

If it is possible to rob an individual of his masculine characteristics, strength, character, and health by denying him the puberty gland secretion is it not possible to activate surgically a dormant structure. This is possible and may be accomplished by vaso-ligation.

By increasing the endocrinological capacity of the puberty gland we automatically give the patient more or less massive and continuous doses of his own gonadal hormone, and as a result stimulate all other ductles gland to increased action, thereby increasing general metabolism above its former threshold by both the processes of anabolism and catabolism. As a direct result there occurs throughout the body an activation with a re-organization of the cell plasma. Products of fatigue and lethargy are eliminated, senile toxins neutralized, while rejuvenation of mind and body ensue.

Unfortunately many ill advised members of the profession labor under the belief that vaso-ligation is solely for the relief of impotence. Although almost a specific for this condition, vaso-ligation is a therapeutic measure for reviving and strengthening the entire body. Its effect upon diseases of the ductless gland system and

those obscure conditions due to a faulty metabolism is little short of marvellous. Diabetes, nephritis, arteriosclerosis, exophthalmic goitre, myxedema, hypertension, and a host of other conditions respond when all other methods fail. All symptoms of senility improve following the operation. Hypertrophy of the prostate, eunuchoidism, mental depression, insomnia, senile dementia, as well as dementia precoox have responded.

Before taking up the surgical technique, it may be well to consider the contra indications. According to Schmidt the only valid contra-indication is where the patient is suffering from a dilated heart, or where myo-cardial degeneration is advanced. Acute exacerbation of any chronic ailment, or during the terminal stage of any disease.

The technique of vaso-ligation as performed by myself is as follows. The operation may be uni-lateral or bi-lateral. The indications being the desired gonadal dose necessary, and must be left entirely to the discretion of the surgeon after he has informed himself regarding the status of his patient as determined by the various function tests, etc.

After the usual aseptic precautions, an incision is made at the root of the penis, from four to six centimeters in length, over the spermatic cord and parallel to it. The cord is easily located at this point, and is in most cases palpable with the finger. The incision goes through skin, fat and fascia, until the cord with its coverings is exposed to view. From this point on the dissection is blunt, and consists in carefully dissecting or separating the vas from the surrounding tissues and its accompanying structures. Great care must be exercised in protecting the blood supply of the testicle. The accompanying artery and vein must not be interfered with, as oedema and sloughing may follow. The vas being freed, an aneurism needle is passed posterior to the structure: it is hooked up and two fine silk ligatures are passed. One at the distal the other at the proximal end, about one-half centimeter apart to guard against a possible loosening due to the peristalsis of the vas. The intervening portion is now resected. To retain the function of suspension that the cord normally performs, the proximal stump of the vas is attached to the subcutaneous tissue or tunica vaginalis propria in the neighborhood of the distal end, and the skin closed by interrupted sutures. No drainage is necessary, the wound as a rule healing by first intention in from five to seven days. I have in all my cases used local anaesthesia consisting of three per cent. nova-cain and adrenalin. I may state that I have been able to obtain perfect anaesthesia, in no case there being the slightest evidence of slough or oedema.

The patient remains in bed from three to four days, after which by the aid of a suspensory he is allowed to go about his work. No pain or inconvenience is suffered at any time if the above technique is resorted to.

The immediate consequence of the operation is a stasis and obstruction of the semen, as well as a gradual atrophy of the whole spermatogenic apparatus, on the side operated. All the cells forming sperma atrophy, with the exception of the so-called Sertoli or basal cells which form part of the seminal epithelium. The interstitial tissue filling the spaces between the seminal canaliculi containing the Leydig cells immediately begin to proliferate, taking the place of the degenerative seminal epithelium. Thus an evolutionary cycle is created. The epithelial elements of the seminiferous tubules being poorly nourished and being relieved of spermatogenic function become transformed into reticulated tissue.

When the testicle proper finds itself placed under conditions where it no longer is able to use spermatozoa, the surviving epithelium evolves in another direction and produces other elements. Its evolution as an external gland thus suppressed it continues to furnish elements in increased amounts and higher concentration for internal secretion.

From twenty to sixty days following operation, very definite symptoms make their appearance. To facilitate matters I shall classify them under two headings: (1) Somatic; (2) Psychic.

Of the Somatic Changes

1. An increase in weight.
2. Growth of hair with increased pigmentation.
3. Increase in the muscular power.
4. A change in the blood pressure from 30 to 50 m.M. of Hg.
5. Improved circulation.
6. Improvement in the special senses.
7. Improvement or return of the sex function, which is observable in all cases.

Of the Psychic Changes

1. An increase in the mental capacity: 1, concentration; 2, memory; 3, acuity.
2. An increase in the enjoyment of work and recreation.
3. An increase in the sexual libido.

These findings are uniform, and have been confirmed by many observers including Lichenstern, Lowy and Zondek. They agree as do many other surgeons and investigators who are familiar with vaso-ligation, that the operation does produce an increase in metabolism, as demonstrated by the above somatic and psychic changes.

In the cachexias of anaemia and malignancy, especially cancer, the gain in weight is great, and begins in from four to six weeks following operation. Finsterer and Horner of Berlin are now treating inoperable cancer with vaso-ligation and have announced some remarkable cures. They are also using the operation in the treatment of post operative cases where there are metastatic deposits. I want you to firmly understand that vaso-ligation is not a specific for the treatment of carcinoma. It so increases general metabolism and body resistance that the individual is able automatically to overcome the disease.

Before going on to the citation of cases I wish to say a word regarding the microscopical pathology of post

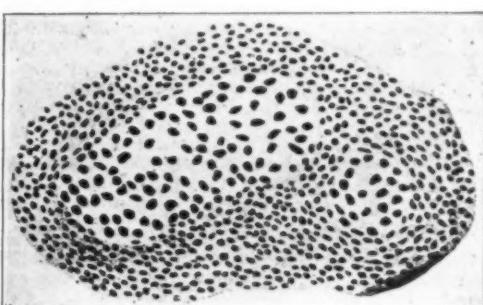
mortem testicular tissue following operation. In September of 1921 I made specimens and present two photographs. The microscopical picture corroborates the explanation as to the fate of the spermatogenic apparatus.

These specimens were fixed, while fresh in picromic-acetic acid. They were imbedded in paraffine, and cut into sections of from five to seven microns and then stained.

I found at the end of one year some seminiferous tubules with spermatids, and heads of spermatozoa. (1). shows the presence of fibrous trabeculae containing cells with elongated nuclei, and simulating smooth muscle fibres. At (2). there are masses formed by nuclei joined by common protoplasm. They resemble blind follicles of the epithelial stage, but the epithelial cells have a clear but poorly defined protoplasm. At their periphery they pass without trace of a basement membrane into reticulated tissue in which a number of free elements are present as a result of a dissolution of a part of the protoplasm.

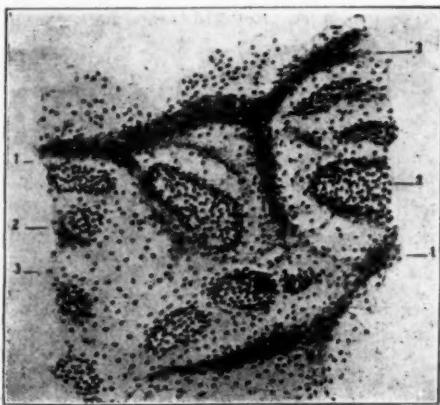
Comparing testicles following ligation with un-ligated testicles, it is easy to understand the evolutionary cycle taking place in the tissue.

In the normal testicle the tubules .10 to .12 m.m. in diameter are contiguous and attached to each other, and only at the hilus is there present a small amount of interstitial connective tissue. After ligation the interstitial connective tissue, and that which constitutes the basement membrane, develops into fibrous strands as in figure (1). As regards the seminiferous tubule, its outer epithelial cells are transformed into reticulated tissue forming an envelope for the remaining central portion of the tubule. The latter exhibits the structure of an epithelial syncytium.



Photograph by "Schloss"

Figure (2) portion of a testicle two months after operation.



Photograph by "Schloss"

Figure (1) represents the testicle one year after operation.

This photograph represents a stage intermediate between the epithelial and the reticulated epithelium containing empty spaces. The cells of the tubules or epithelial buds become enlarged. Then little by little develop into a tissue of small cells in such a manner that several tubules give birth to an ovoid mass or blind follicle. In other words the interstitial connective tissue proliferates and gives rise to young tissue which strangles and chokes the epithelium of the seminiferous tubules.

Case Histories

In order that you may gain some idea of the progress of an actual case of vaso-ligation, I have picked at random from my office files the histories of two individuals operated upon by myself. I also shall present a case as operated upon by Schmidt of Berlin.

Case (1)

In January 1919, I was consulted by Dr. S—— who complained of frequent urination, incomplete emptying of the bladder and pains in the rectum. He suffered from insomnia, lassitude and great fatigue following the slightest exertion. Urinalysis showed a two per cent. sugar reaction, of a casual specimen. Acetone and diacetic acid were present. Three twenty-four hour specimens as well as three blood sugars substantiated the diagnosis of diabetes mellitus. He stated that his sex function was altogether wanting, and had been dormant for the past three years. Physically and mentally this patient was older by far than his years. He blamed his present condition to a very active surgical practice which had sapped him of vitality and robbed him of all reserve. Digital rectal examination revealed a greatly enlarged prostate that was delicately painful. The vesicles were red and congested and gave severe pain on the passage of a catheter.

The doctor had been treated for some time by the Allen method of starvation for his glycosuria. He did not improve, but lost a great deal of weight and strength, and was forced to discontinue the treatment. He literally came to me offering himself as a human sacrifice to the benefits of vaso-ligation. Insisting that the reports he had seen and heard while on a visit to the continent as to the treatment of chronic disease by this method were miraculous, he wanted to be operated. As his bladder condition was giving him great inconvenience I decided after careful consideration to try the measure. On the fourth of February, 1919, vaso-ligation of the left side was performed under local anaesthesia. On Feb. 10 my patient left the hospital taking passage for Europe. On June the first he presented himself at my office. He had gained seven pounds in weight. His heretofore pale and pasty skin was moist and ruddy. He stated that his annoying prostatic condition had been entirely relieved, and that he was enjoying life for the first time in years. The urine after careful and diligent examination failed to show the presence of sugar. A tolerance was made and three successive blood sugars were as follows: .11, .115, .11. Digital examination of the prostate revealed the fact that it had decreased in both size and consistency. After complete emptying of the bladder a catheter failed to disclose the presence of any residual urine. Three months after operation there was a return of the sex function to normal, allowing the patient to co-habit in a normal way.

In other cases following operation, I have noticed a distinct decrease in the size of the prostate. I have also observed this in post operative gland implantations. After studying this phenomenon I have come to the conclusion that during the course of a hypogonadic state there occurs a hypertrophy of the prostate; which leads me to believe that the puberty gland secretion works in unison with the secretion of the prostate. If it is possible to exclude malignancy there is evidently a form of prostatic enlargement connected with waning sex function, which theoretically ought to respond to vaso-ligation, which increases the gonadal secretion thereby lessening the probable necessity for over activity on the part of the prostate.

This patient up to the writing of this paper remains in excellent shape, mentally and physically. The gonadal actio seems to be cumulative. It is needless to say the doctor is a booster of vaso-ligature.

Case (2)

Another interesting case worthy of note was that of a man operated upon by Dr. Schmidt of Berlin. Male, building contractor, forty-seven years of age, complained of tiredness and inability to do any physical work. He fell asleep in his chair during the forenoon. Memory rapidly deteriorating. In spite of better nourishment during the past two years (after the war) he lost fifty pounds in weight. Sexual activity decreased, coitus once a month, without pleasure. The patient was unable to earn his living. The physical examination showed an emaciated aged man, with tired facial expression, hair grey on the temples. Hands and ears cyanotic and cold. Weight one hundred pounds. Systolic pressure 135 m.m. of Hg. Urine negative. Internal organs negative. Wasserman negative. No history of venereal disease. Diagnosis—Senium Praecox with beginning arterio-sclerosis.

On Feb. 7, 1921, vaso ligature of the right side was done. On Feb. 17, the sutures were removed. Weight sixty-six and one-half kilos. His hands were redder and warmer. On March 10 (one month after operation) weight seventy-one kilos. Systolic pressure 121.

He stated: "I can count the tiles on the roof of the opposite house. Five weeks ago I could only see them as a blurred mass. I am feeling as well as in former years. My mind is clear and the tiredness has disappeared. I can work as before. Previously I had not had coitus for six months, now I feel such a strong impulse that I co-habit daily with a great sense of pleasure."

On April 4 by letter: "I am sorry that I am not able to come to Berlin this week. I feel well and strong, and my appetite is good. I sleep well, and am very grateful to you that you have made a man of me."

On April 15 (Two and a half months after operation). Weight seventy-three kilos, a gain of eight kilos. The patient had a surprisingly fresh look. He looks surprisingly young for a man of forty-seven.

May 8 (three months after operation). The following letter with a repetition of his history was received: "My weight decreased since 1919. I steadily grew worse, and did not know whether I was dead or alive. I was always tired and could not sleep. I was shrinking away to nothing. Every one who saw me said I looked like a man of eighty. I went to Berlin for advice. You operated upon me Sept. 7 and after a short time I could take up my work again. In spite of my hard work I am looking young and fresh again. I have healthy sleep and sexual intercourse as formerly."

Case (3)

Another case worthy of mention is that of a man thirty-two. For some years he had been a sufferer from intense frontal and occipital headache. Insomnia had been a constant feature. At times he did not have a bowel movement for four days. The physical examination did not reveal any great deviation from the normal, aside from the fact that the testicles were somewhat atrophic. The history of the case elicited the fact that this patient practiced masturbation excessively from the age of eighteen to the age of twenty-two. Shortly following the discontinuance of his habit he lost the power of erection, at which time the headaches, constipation, and insomnia made their appearance in the order named. They were persistent and resisted all manner of treatment.

A uni-lateral vaso-ligation was done with the following results. Three weeks after operation the bowels were being evacuated daily, without the use of a laxative. The headaches were slowly disappearing and at the writing of this paper the patient is again in the pursuit of his profession as that of an architect. The sex function of erection and ejaculation are normal. The fluid showing the presence of motile spermatozoa. I might add that this patient is now married and happy.

The question logically arises as to why the puberty gland exhibits hypo-function at the expense of body tissue. In other words is there any etiological factor that predestines the ductless gland chain to be the first cog in the wheel to show strain.

In any intricately constructed mechanical device, that portion which controls and is most highly organized, is the first to manifest a condition of disturbed equilibrium, as the machine continues to work. Secondly those portions dependent on the master ability of this highly organized unit show evidence of imbalance, and as an end result we see in-co-ordination. So it is with the ductless glands, especially the sex glands. These glands constantly exert a vis a tergo with the vegetative nervous system, and there is constantly a definite inter-relationship between them. As both the sympathetic and autonomic portions are highly organized, and delicately sensitized units, the slightest lowering of either nervous or glandular threshold invites imbalance at the expense of the general organism.

As disintegration is the logical termination of all things mechanical, so senility is the ultimate complication or sequellae of cell life. This, however, is a natural complication, which may be attributed to the ravages of time, just as it is a premature consequence in pre-senile types, of indiscretion and lust.

In my paper I have referred entirely to men. However the female sex may share to some extent in the rejuvenating process and reap the benefit of renewed activity and grace.

Many gynecologists who have treated women for uterine fibromata, and other pelvic disorders by the use of the x-ray have noticed the stimulating effect the treatment has had on the health of the patient. In all probability most physicians would ascribe the improvement in appearance and general well being to the cure or alleviation of the pathological condition. In view of the Steinach

hypothesis, the result of the exposure of the ovary to the rays assumes an entirely new aspect. In other words the frequent dosage destroys the connective tissue of the gland, causing the generative tissue of the ovary to atrophy. As it is no longer called upon to manufacture the germinal elements, it evolutes and by virtue of this fact there is an increase in the internal secretory cells.

In conclusion it may be well for me to quote the words of another author, who has become intensively interested in the method. He states: "Taking everything into consideration, that I have seen, heard and read, I have no doubt whatever any more, that the operation deserves to be taken very seriously, and not only that,

but deserves to be used as a very valuable therapeutic agent."

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X-Ray Treatment of Menorrhagia, Dysmenorrhea and Uterine Fibroids

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For the past eighteen years *x*-rays have been employed for the treatment of uterine maladies, and each year we learn more on this subject. The development of new apparatus for roentgen therapy, as well as the elapse of time for the collection of statistics are both important factor in this connection. The invention of the Coolidge tube has added greatly to the employment of *x*-ray treatment, since one can measure and repeat the same dose quite accurately while using this form of tube. One often obtained good results with the older type of tube, but they were difficult and tedious to elicit, and oftentimes they were failures.

It is definitely known that if the ovaries receive sufficient radiation, they will not function further, and as a result the menstruation will cease. This is true in any case regardless of the age of the individual, and it is this known fact that forms the basis of therapy in the cases in question.

The action of the rays on the ovaries causes destruction of the graafian follicles, which are essential elements in the menstrual cycle. Since the graafian follicles are very susceptible to the *x*-rays, it is readily seen why menstruation ceases after exposure to radiation. The ripe follicles are more susceptible than the primordial follicles. A small dose, therefore, will have a tendency to destroy the ripe follicles and cause a period of amenorrhea, whereas larger doses may destroy the primordial follicles also, and produce a complete cessation of menstruation. The age of the patient is a factor in determining the dose—the younger the patient, the more radiation is necessary to accomplish results.

All cases of menorrhagia are not favorable for *x*-ray treatment and this method should not entirely supplant surgery of the female generative organs. There are two types principally which should not be treated with *x*-rays, namely: malignancy, and cases where there is an inflammatory pelvic condition (such as pus tube). These cases require surgical intervention, as well as the application of radium in those which are malignant.

In selecting patients for *x*-ray therapy one must be careful to avoid cases of malignancy. The younger patients are less likely to be malignant than the older ones. If there is any doubt, however, it may be well to resort to curettage for diagnosis. No case will exhibit a prompt response to *x*-ray therapy if there is an underlying malignancy present. If there is an inflam-

matory condition present, however, there may be a tendency to alleviation of the system by depressing the function of the ovary, and in such cases there will be no harm done by the application of the rays.

The most common form of menorrhagia the writer has treated is that occurring near the menopause age, in which no cause could be determined. In such cases the pathological bleeding is merely a variation in amount, duration, character or periodicity from the normal menstrual flow. This is probably the result of a disturbance of the graafian follicles in some stage of their development. The natural course to follow, therefore, is to destroy the graafian follicles.

This class of patients usually complain of very profuse menstruation during their regular menstrual periods, or a continuous uterine hemorrhage with no relation to the periods. Most commonly when referred they are quite anemic, nervous and generally upset, and have either refused operation, have been operated upon with no relief of symptoms, or they are bad surgical risks.

The technic employed is a cross-fire application of the *x*-rays through three portals of entry above the symphysis. Five milliamperes are administered through a three millimeter aluminum filter for five minutes using an eight-inch spark gap at a nine-inch target distance. This dose is applied over each portal of entry and is repeated in three weeks if necessary.

Some of the patients responded to one dose and there was a complete cessation of the menstruation. Others had more, but rarely has it been necessary to repeat the dose more than four times in patients near their menopause age. Hot flushes and other symptoms may accompany the induced menopause, but they are no worse than are observed in a natural menopause.

In regard to dysmenorrhea, radiation is of extreme value, especially when the menstruation is profuse. One must proceed with great care, however, in the treatment of such cases in young patients so as to avoid an artificial menopause. Radiation of the ovaries usually gives good results, provided there is no accompanying inflammatory process as described above.

The treatment of uterine fibroids is very successful. In these cases particular attention should be drawn to directing the rays towards the uterus as well as the ovaries, as it is believed that the rays have a direct action on the fibroids. There are three theories as to the mechanism by which the fibroids are diminished in size. The

first is that the fibroid shrinks in the same manner as those fibroids which are present in women who have passed the menopause. The second theory is that there is a direct action upon the smooth muscle cells by the rays, causing them to degenerate and become replaced by connective tissue. The third theory is that the endarteritis caused by the *x*-ray is severe enough to starve the growth.

The same doses and method of application are applied in fibroid cases as previously described. The size of the tumor becomes definitely smaller and in some cases it disappears entirely.

The first treatment usually causes a diminution of the size of the uterus, but it is most markedly observed after the third series of exposures. In cases of large fibroids where symptoms of compression exist, especially of the bladder, these symptoms are alleviated after the first treatment and are improved gradually with succeeding treatments. The menorrhagia, which in a great many

cases accompanies a fibroid uterus, disappears; and in addition there is a suppression of the menstrual function. This suppression is accompanied by the appearance of hot flushes characteristic of the menopause, and is a signal for stopping the treatments.

In some cases the menstruation becomes more profuse before it disappears. Usually the menopause remains permanent, but in some patients it is only temporary; however, in the latter cases, a few more treatments will invariably produce a permanent menopause.

In conclusion I feel justified in stating that *x*-rays are exceedingly valuable in the treatment of menorrhagia, dysmenorrhea and uterine fibroids. Therapeutic results are obtained without pain, and without any change in the usual mode of living. They are of inestimable value in cases where surgery is contra-indicated, such as age, obesity, general poor condition, extreme anemia and pathology in the heart, aorta, lungs, kidneys or liver.

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ANESTHESIA

Its Use and Abuse

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For one to extol to the medical profession the value of anesthesia would be like carrying coals to Newcastle. Every physician, at some time or another, has blessed the discoverers of these wonderful drugs. Most medical men, however, greatly underestimate the proper administration of anesthesia. No specialty in medicine is spoken of with less respect than that of anesthesia. We daily hear physicians say that they let husbands or practical nurses give chloroform to the parturient patient, and it is unheard of for a physician to say that he cannot give an anesthesia. In some hospitals the governing board has learned of the gain they can derive from this specialty, and nurses have been engaged for the purpose at a yearly salary so that the extra income can accrue to the hospital. They commercialize such a hazardous specialty for pure monetary gain. Buxton, in his book, says that every time a patient takes an anesthesia he puts one foot in the grave.

At the 1921 session of the A. M. A. in Boston, anesthesia received its first recognition as a specialty by being granted a Section under "Miscellaneous Topics." More glory was given it about a year ago when Dr. Morton, discoverer of ether as an anesthetic, was given a place in the Hall of Fame.

It is the duty of the medical profession to recognize anesthesia as a vital specialty, and to awaken to the fact that the giving of an anesthetic is one thing and the art of administering anesthesia is another.

As to the essential points in administering an anesthetic: We very often find men who pride themselves on always putting and keeping their patients very deeply under the anesthetic. I do not agree with them. The purpose of an anesthetic is simply to enable the surgeon to do his work without any interference from the patient; and the art of anesthesia is to see how lightly one can keep the patient under the influence of the anesthetic and still give the surgeon free rein.

All good text-books discuss in detail the importance of the preoperative preparation of the patient by the anesthetist—the importance of conversing with the

patient, of taking the blood pressure, and other valuable points; but it must not be forgotten that in most instances the first introduction the anesthetist has is when the patient is about to go upon the operating table. That is not an auspicious moment for introductions. Therefore the preoperative preparation should be left to the attending surgeon.

The method of starving the patient prior to an operation is obsolete, having proved to be a disadvantage to both anesthetist and patient. We now feed light meals of cereals, sugar, malted milk, vegetables, fruits, and white bread up to six hours prior to operating time, giving the patients plenty of water, especially alkaline. The night prior to the operation, castor oil and an ounce of soda bicarbonate should be administered and in the early morning an enema with bicarbonate of soda.

As to the choice of the anesthetic, I believe the safest, the most easily induced, and the most easily carried anesthesia is that of nitrous oxide and oxygen with ether, given by an apparatus with regulated rebreathing. The results are less toxic than following those when the older methods of administering ether or chloroform are used, and there is practically no shock. The recovery is more rapid and comfortable. In my opinion, the apparatus best adapted to this method is the latest Gwathmey-Foregger. It consists of four cylinders of gas, two of N_2O and two of O. The advantage of this machine is that one can see the proportion of gas and oxygen that is being administered, for the gas flows through two tubes with holes into a glass jar containing H_2O . It also has two more bottles attached, one for $CHCl_3$, and one for ether, which enables the anesthetist to give either the gas pure, or with $CHCl_3$, or all together. This is all passed into a rubber bag which at the same time allows rebreathing. This rebreathing can be regulated by a valve on top of the face piece. This mechanical administration of anesthesia enables the anesthetist to devote his entire time to watching the patient's reflexes and breathing.

Nowadays the anesthetist does not have to stealthily add some ether to the N_2O -O, fearing that the surgeon may notice. He does so openly, for he knows that the nitro-oxygenated ether is the safest anesthetic because the ether is volatilized by the N_2O and corrected by the oxygen. Miller, before the Providence Medical Society, said: "From the standpoint of safety and efficiency, we can predict that ether will be the routine anesthetic of the future, aided by nitrous oxide."

An additional advantage is found in this Gwathmey-Foregger apparatus, thanks to Dr. Erdman of Brooklyn, in his inexpensive attachment to the apparatus, whereby one can give ethyl chloride through the same apparatus. A few whiffs of ethyl chloride will quickly deepen the ether anesthetic.

In using the Gwathmey apparatus one must remember to have the room absolutely quiet for when N_2O-O is used the hearing is at its keenest and the slightest sound is greatly reverberated on the patient's ear drums. Both the N_2O and O control valves are opened in relations of 4-1, and the bag is filled about three-quarters full; then the flow of the gases is turned off. See that the rebreathing valve on top of the mask is open half-way and that the rubber face cushion fits the face tightly.

After assuring the patient that he is getting only a little gas and that he will go to sleep in two or three minutes if he breathes deeply, place the mask on the face, close the shutter to allow the gas to flow, and begin to open the N_2O control valve, allowing it to flow through until you see the gas flowing through four holes and then open the O control valve allowing it to flow through one hole only. Continue it this way throughout the operation. Should the anesthetist want to put the patient under very rapidly, open up the N_2O stopcock until the gas is flowing through all the holes even through the bottom of the tube itself. If any cyanosis appears, add a little more oxygen, but be careful not to give too much oxygen or the patient will come out of the anesthetic. When the breathing becomes regular and deeper, begin adding ether at first by only turning on and off the ether stopcock, then, as the patient is going under gradually, give more ether. Should the patient be alcoholic or a burly longshoreman, use the chloroform bottle in the same way, in place of ether.

The next step is to close the rebreathing valve, allowing the patients to rebreathe, which will give a more even anesthesia, and at the same time aids in preventing surgical shock. Never allow the bag to become empty, as a patient may go into shock by breathing from a vacuum. Every fifteen minutes I open the rebreathing valve and expel all the air from the bag and put in fresh gas, because too much rebreathing of the same air is likely to cause a post-operative headache. Toward the close of the operation the ether is shut off altogether and the N_2O-O is used, and, finally, only oxygen, to air the lungs.

It may be said that with properly administered anesthesia cases will recover without vomiting, but we have seen patients vomit, and persistently so, following the services of the most skilled anesthetists. This is caused by acidosis intoxication. Some patients are more susceptible than others, especially nervous people and children, or persons with deranged gastro-intestinal systems. The only panacea for this vomiting is sodium bicarbonate, which should be given pre-operatively with castor oil, as already mentioned, followed in the cases of persistent post-operative vomiting by lavage and the Murphy drip.

If we are not provided with the Gwathmey apparatus, we must fall back on the old drop method, either open or closed. Even in this method there is a proper and an improper technique. It is important always to hold the patient's jaw forward, pulling the chin away from the chest as much as possible. This prevents swallowing the ether-soaked saliva, which causes coughing and retching that is the bane of the anesthetist.

It is also valuable to the anesthetist to remember that the usual conscious and unconscious muscle movements of the first stage of anesthesia are held more or less in abeyance by administering a few drops of oil of orange on the mask preliminary to the anesthetic. Gwathmey says it physiologically prevents stimulation of certain reflex nerves and also deadens the sense of smell and the odor of the anesthetic, and the patient goes under before he is aware of it.

Shall we use the open or closed method of administration of ether? There is no doubt that more severe toxic effects follow the closed than the open method. The reason is the deficiency of oxygen and the excess of CO_2 in the blood.

Many hospitals and anesthetists, as a routine, give morphine sulphate prior to the operation. I do not think it is a good rule to use it as a general routine except with alcoholic or obstreperous patients, because it robs the anesthetist of one of the most important watch-points of the depth of anesthesia,—namely, the pupillary reflex; it also lengthens the period of induction and retards the elimination of the anesthetic from the system, thereby giving the patient a lengthened period of nausea and increasing the chance of the toxicity of the anesthetic, since it remains longer in the system. Gas pains also are more frequently found in patients who have had morphin before the anesthetic. However, Gwathmey has recently published an article wherein he states that by giving the morphin with about 2 c.c. of a 25 per cent. solution of magnesium sulphate a better relaxation is obtained and the nausea, vomiting, and gas pains are much reduced, or are eliminated altogether.

Many hospitals have entirely tabooed the use of chloroform. Personally, I think chloroform is of great advantage in administering an anesthetic to children and the aged, if used only for the induction stage, as it puts patients under much more quickly and lessens the shock considerably. One never uses chloroform with puny children who have pale, pasty complexions, enlarged tonsils and adenoids, enlarged tongue, and enlarged glands, for there is the possibility of status lymphaticus.

In obstetrical cases we find chloroform much more useful than any other anesthetic. However, since it is a severe protoplasmic poison and may injure the child or mother, it is not now used so frequently as heretofore. Since the effects of chloroform on the respiratory tract are only secondary in lung cases, such as tuberculosis and asthma, chloroform is much more nearly ideal than ether. In the obese and alcoholic, and in all nervous and insane conditions, chloroform again comes to the front as the better anesthetic. Finally, in cases where the actual cautery is to be used, chloroform not being inflammable, is again the ideal anesthetic.

Contrary to the general belief among physicians that ether is usually the anesthetic to be used, it, too, has its contra-indications. In all conditions of C. N. S. disturbance or in operations on the brain, ether is contra-indicated. In operations on the mouth and neck, unless one uses the intratracheal tubes or a pumping apparatus, ether is contro-indicated, especially where the actual cautery is to be used. In chronic lung cases or asthmatic or tuberculous patients, ether should not be used. Finally, in patients with high blood pressure its use is dangerous on account of its tendency to raise blood pressure. Excepting for these few contra-indications, ether is safer than chloroform; it does not affect the heart,

and many of its reputed disadvantages are undoubtedly due more to faulty administration than to its toxicity.

In conclusion, I wish to say a few words about the post anesthetic treatment. H. A. Saunders, in the New York Medical Journal, says that quinin muriate, given in 10 grain doses in a retention enema of one pint of a 5 per cent. solution of lactose and soda bicarbonate, prevents backache and gas pains. This should be repeated at three to four hour intervals. The soda bicarbonate given post operatively is very useful; in fact, as soon as a patient is able to retain liquids he should be given bicarbonate with his lemonade.

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1549 St. Nicholas Avenue.

TREATMENT OF GOUT

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It is difficult to differentiate between foods and medicines with our present day conceptions of organic and physiologic chemistry. There is even some justification in considering alimentary, toxic, and neutral products as merely relative and convertible terms, for unless insoluble or inert, whatever is introduced into the body, whether by the mouth, rectum, hypodermically, intramuscularly, by inhalation or by absorption through the skin, brings about a physiological reaction affecting nutrition or producing some subtle but definite influence on the body cells which may include incidence or correction of such irregularities as gouty manifestations.

It is remarkable that under normal conditions, in spite of the mixed food intake, some kaleidoscopic rearrangement takes place in the molecules during passage through the digestive tract; a sorting out as it were of the various chemical groupings, by processes continually at work, so that organic acids, alkalies, proteins, carbohydrates, toxines and undesirable material are neutralized or split up into harmless compounds, by what we call metabolism and these analytic and synthetic methods carried on in our own personal laboratory, elaborate a pabulum for the nutrition of the somatic and parenchymatous cells for the maintenance of life and well being. Even when unbalanced digestive functions give rise to gouty manifestations, we are often unconscious of it, because our elaborate compensating and adjusting mechanism usually overcomes minor difficulties, and it is only when painful symptoms thrust themselves upon us, that we attempt through diet and medication to obtain relief.

The ancients knew of and treated gout much as we are doing today by diet and colchicum, but if we have not made much progress in our therapy, prophylactic measures have diminished the incidence of severe symptoms of podagra.

Guelpa, an authority of Paris, eliminates vegetable diets and mineral waters which he claims increase the calcario-uratic deposits, causing inflammation, muscular atrophy and pain from long want of function. Patients are given a liberal nitrogenous diet for ten days and for three days an intensive protein diet of sweetbread, brain, liver, etc., avoiding vegetable diet containing abundant basic salts. This is

followed by absolute fasting for from three to four days, during which time he gives saline purgatives.

William Bain of England after making extensive investigations with the various remedies prescribed in gout, found that: (1) there is an increase in albumin coincident with the development of a sub-acute attack of gout; (2) a preponderance of serum globulin over serum albumin; (3) there are present in the blood the peculiar leucocytes described by Chalmers Watson; (4) lithium benzoate and urotropin were found ineffective as regard uric acid excretion; (5) tartrate of piperazin, lysidin, and sidonal showed an increasing eliminative effect on the uric acid in the urine; (6) the excretion of uric acid was not increased by colchi-sal, but patients were of the opinion that they derived from its use greater benefit than from any of the other drugs. Modern therapy explains that like hormones, alkaloids, glucocides, synthetics, and many so-called drugs act directly or indirectly through the blood and lymphatics on the autonomic, sympathetic and parasympathetic nervous mechanism which control the vaso-motor blood supply and therefore the activity of all glands, stimulating or inhibiting the endocrine secretions, increments and excretions; it is conceivable, therefore, that with appropriate remedies such as the alkaloid of colchicum (colchicine) we may be able to modify metabolic changes which underlie the pathology of gout and incidentally influence uric acid retention and elimination of nitrogen in the form of urea, uric acid or purines.

Inflammatory swollen joints may be relieved by applications of a saturated solution of magnesium sulphate.

16 Fifth Avenue.

The Percy Method of Treating Cancer of the Uterus Applied to Treatment of Cancer of the Rectum.

William H. Kiger, of Los Angeles, Cal., advised the American Proctologic Society that, since he adopted the Percy cauterization method to the treatment of cancer of the rectum three years ago, he had used it in all his cases, a total of forty-five, without operative mortality; and that from these he had selected three typical cases to report. It had been amply demonstrated by his series of cases that incising the sphincters with the cautery makes it possible to preserve the greater part of them as useful structures, and he does not expect to have to report later that the anus was converted into a ring of scar tissue by the treatment. His technic depends somewhat on the location of the growth. If the tumor is not very large or not more than half the circumference of the bowel is involved, he incises both sphincters with the cautery knife which Percy uses in incision of the breast. The knife should be heated a bright cherry red in order to cut through quickly, which prevents too much destruction of the severed ends of the muscles, and at the same time sears the surfaces sufficiently to prevent transplantation of cancer cells from the exposed mass in the rectum. This incision definitely exposes the growth, and, if it is situated near the sphincters, can be extended into the mass, but need not go through it since the heat infiltration is the important factor. His water cooled speculum can be introduced so as to protect the uninvoluted structures, and the cautery head laid on the growth and left from forty to sixty minutes or until the mass is thoroughly hot or pasteurized, care being taken to avoid carbonization of any of the involved structures. If the whole circumference of the bowel is involved, the water cooled jacket or the small water cooled vaginal speculum can be used to cover the heating iron and protect the sphincters from prolonged action of the heat. Either of these instruments may be found useful in some situations or conditions where his special water cooled rectal specula may not fully meet the purpose. He has also had two extra sized cartridge shaped heating heads made to more quickly expose massive rectal cancers to a greater body of heating surface, till by constant contact the parts are thoroughly and completely heated through.

Wilde's cords the transverse striae of the corpus callosum) are named for Sir W. R. W. Wilde 1810-1876), Irish surgeon.—(Med. Facts.)

MERALGIA PARESTHETICA

Case Report

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Camden, N. J.

Case Report of *Meralgia Paresthetica*.

Joseph D., white, male; age 21 years, single. Tailor. Complained of pain over right hip bone and along right thigh; has feeling of "electricity."

Family History—negative.

Previous Medical History—Had a bilateral mastoid operation 18 years ago, following an attack of scarlatina, measles, "colds"; otherwise well.

Present Illness—"Sprained" right groin May, 1921, and wore a truss for the past seven months. Noticed "sticking and electric" pains over upper right thigh and buttock and particularly along the outer side of the thigh; this trouble he has now had for several weeks. Feels like "needles" sometimes—much worse after walking or working, over an area about 2 outstretch hands (in size). Presses a treader of a sewing machine with the right foot.

General Examination.

Teeth—in good condition.

Throat—practically negative.

Heart and lungs—negative.

Blood pressure—L. 118; D. 88—Auscultatory.

Blood Wasserman—negative.

Blood Count—

R. B. C., 5,960,000; W. B. C., 8,040; Hb., 95%

Differential—

Small lymphs, 29; Large lymphs, 1; Polys, 69; Eosino, 1.

Wine Analysis—pale, straw color; clear, no sediment; acid, S. G. 1.010; no albumin, no sugar; no casts; no W. B. C.; no R. B. C.; occas, uric acid crystals.

December 10, 1921, G. B. Wood reports left cervical lymphnode (deep) enlarged, firm and movable, septum straight; palato-pharyngeal muscles slightly reddened and thickened. Larynx—negative. Lingual tonsil moderately enlarged; no sinus tenderness or other evidence of sinus disease. No purulent discharge. Tonsils, small submerged, apparently not disease.

This patient came (Dec. 10, 1921) to the medical clinic of the Polyclinic Hospital in the service of Dr. Albert E. Roussel, where I studied him thoroughly and concluded that his trouble was probably due to the pressure exerted by the truss which he wore for seven months. I wish to express my thanks to Drs. Roussel and Callahan for the privilege of studying and treating this case and for permission to report the results of my studies.

The patient was told to put aside the truss—and he was given some cincophen tablets and a liniment (Liniment Methyl-Salicylat. Comp.—Goldstein). Baking and massage were ordered.

In the *American Journal of Medical Sciences*, November, 1921, pages 720-735, I reported six cases of meralgia paresthetica and reviewed the literature on the subject. It is therefore unnecessary to go into further details in this brief report. They are probably about 140 authentic cases on record in the medical literature.

1425 Broadway.

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SPORADIC PTOMAINE POISONING

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Under the heading, "Botulism," many cases of food poisoning are reported. Gould's Dictionary would seem to confine botulism to sausage poisoning. He says of ptomaine—"is basic compound formed by the action of bacteria on animal or vegetable tissue. Many ptomaines are poisonous." Dunglison's dictionary, botulism—"sausage or meat-poisoning, a form of ptomaine poisoning," caused by introduction into the system of such products of decomposition (Botulism is from botulus, a sausage). It would be well if botulism were confined strictly to poisoning from eating sausages.

Many writers seem to use botulism and ptomaine poisoning as synonymous terms, but all imply that these cases are caused by the presence of bacteria in the food previous to its introduction into the stomach (or in common parlance, eating spoiled food). Which, of course, is the case where a dozen more or less are poisoned by partaking of a certain food—ice cream, for instance.

My object is to call attention to sporadic cases of ptomaine poisoning, where all the symptoms of poisoning are present, after eating perfectly wholesome, well-cooked food. Any physician is liable to be called to a sporadic case of ptomaine poisoning, the individual may have partaken of wholesome well-cooked food, in a restaurant or hotel or with his family, all or many of whom had partaken of the same food, and experienced no disturbance.

The cause of the particular case of sporadic ptomaine poisoning may have been extreme exhaustion or great worry or fright, just previous to his eating. The food did not digest under the circumstance. The poison generated was from bacterial decomposition, but the food was fresh, wholesome and well and properly cooked when eaten. Had the individual rested an hour or two until the fatigue, or the worry or shock lessened, the same food would not have caused any disturbance. The laity, do not understand why extreme exhaustion or worry should effect the stomach. That extreme exhaustion should cause indigestion is understandable, but the effect of the mind on the stomach—on the digestion of food, we can only know by experience. We must know more of psycho-pathology.

I was once called to see a baby in convulsions. On my arrival, a few minutes after the call, the baby was dead. The second child, father and mother, were well and healthy, and the first child was about two years old and was healthy and well developed. I was the family physician—had delivered the mother of a fine, healthy, well-developed boy three weeks previously. The mother was sitting up, the nurse had left the room for a few minutes. The first child, which was playing on the sofa, tumbled off on the floor. It screamed more from fright than from injury. The mother jumped from the chair and the nurse rushed into the room. While the nurse was quieting the child who had fallen, the mother took the baby (who had been awakened) by the excitement from its crib and put the baby to the breast. It nursed vigorously for a few minutes, had a violent convulsion and died. The shock and fright of the mother, produced a poison in her milk. What was the psycho-pathology—the chemical poison in the milk? Who knows?

Chronic Gonorrhea.

Buschke and Langer say the importance of gonorrhea as a general disease, the foci usually inaccessible to direct medication, impresses the necessity for perfecting specific vaccine therapy as apparently the only way to root out the disease in many cases.—(Med. Klin., January 15, 1922.)

Preparation and Administration of Arsphenamine and Neoarsphenamine

The *Public Health Reports* for August 4, 1922, publishes these standard instructions for the preparation and intravenous administration of arsphenamine and neoarsphenamine for use by the medical departments of the army, of the navy, and of the veterans' bureau, and by the Public Health Service. They are so important that their reproduction is desirable.

Reasons for Issuing Instructions

Reactions following the use of arsphenamine and neoarsphenamine are still occurring in the Government services, although experience has shown that these reactions can be reduced to a minimum by the use of proper methods of procedure. Practically all serious reactions which have occurred in the Government services during the last five years have been specially investigated, and in nearly every instance it has been shown that the reactions were due (1) to some error in the technique of the preparation and administration of the drug or (2) to faulty examination of the patient, especially in relation to the effects of previous injections. In no case has it been possible to prove that the reactions have been due primarily to inherent toxicity of the drug itself. It therefore seems desirable to issue a complete set of instructions on technique.

Instructions are issued by each manufacturer, and they vary in some details with each product. In general, these instructions are satisfactory for the particular brand concerned; but as the same standard of relative non-toxicity is required by the Government for all brands, it is not considered desirable in these instructions to individualize the products.

The following instructions may seem unnecessarily explicit, and the technique outlined may differ from others which give satisfactory results. However, every essential statement contained herein is based on the results of the study mentioned above. The procedures given are designed to make the treatment safe and at the same time not to make the technique unnecessarily exacting or cumbersome for the clinician.

Choice of Drug.

Although neoarsphenamine is more popular than arsphenamine, on account of ease of preparation and administration, which constitutes a real advantage under some circumstances, attention is called to the fact that neoarsphenamine is a much less constant and less reliable preparation than arsphenamine.

Not only do certain batches of all brands of neoarsphenamine show a tendency to deteriorate with age but there is also a pronounced irregularity in the therapeutic activity of different batches of neoarsphenamine, regardless of the age and source of the preparations. As a result of these variations, the physician may obtain a much less satisfactory therapeutic result than when arsphenamine is used. Arsphenamine, regardless of age, brand, or lot number, shows a more uniform therapeutic activity. It is probably, also, inherently more potent. Arsphenamine should, therefore, be used whenever practicable, and neoarsphenamine should be reserved for situations in which it is difficult to give arsphenamine.

Arsphenamine.

I. LICENSED PRODUCTS.

The following firms have been licensed by the Treasury Department to manufacture or to import arsphenamine:

A. LICENSED TO MANUFACTURE.

Name of firm and address.	Name of trade product
Dermatological Research Institute, 1720 Lombard Street, Philadelphia, Pa.	Arsenobenzol
Diarsenol Company (Inc.) Buffalo, N. Y.	Diarsenol
Mallinckrodt Chemical Works, St. Louis, Mo.	Arsphenamine
H. A. Metz Laboratories (Inc.) 122 Hudson Street	Salvarsan
Powers-Weightman-Rosengarten Co., Philadelphia, Pa.	Arsenobenzol Billon
E. R. Squibb & Sons, New Brunswick, N. J.	Arsphenamine

B. LICENSED TO IMPORT.

Name of firm and address	Name of trade product
Farbwerke, vorm. Meister Lucius und Brüning, Hoechst-am-Main, Germany.	Salvarsan
Poulenc Frères, 92 Rue Vieille-du-Temple, Paris, III, France.	Arsenobenzol Billon

II. METHOD OF INJECTION.

Only the gravity method should be employed in administering arsphenamine.

III. MATERIALS REQUIRED.

- A. Erlenmeyer flasks, 500 to 1,000 c. c. capacity.
- B. Funnels, glass, 4-inch.
- C. Cyinders, graduated, 500 to 1,000 c. c. capacity.
- D. Gravity apparatus, consisting of—

1. Gravity graduated glass cylinders, 300 c.c. capacity; long graduations at the 100 c.c. marks; medium long graduations every 25 c. c.; short graduations for each 5 c. c.; the zero point to be at the top and the 300 mark to be at the bottom of the cylinder.

2. Rubber tubing, pure gum, heavy wall, inside diameter, $\frac{1}{4}$ -inch (about 4 mm.), of length to limit height of the cylinder to 3 feet above the patient's arm.

Caution: Before being used the first time the tubing should be filled with normal sodium hydroxide solution for not less than six hours. It should then be thoroughly rinsed in water, sterilized by boiling, and then thoroughly rinsed with sterile water again just before using.

3. Needles with slip joint, 19 standard gauge, medium bevel, length of cannula $1\frac{1}{2}$ inches. While not necessary, the Fordyce type of needle is a great convenience. The correct gauge is highly important, as it influences the rate of flow. Proper care of the needles is important. They should be cleansed immediately after use, and precautions taken to prevent rust. Just before sterilization, the point should be freshened on a stone, if necessary. A dull needle tends to make a dissatisfied patient.

4. Glass tubing, 6 mm. in diameter, for windows, which should be inserted in the rubber tubing so as to be a few inches from the lower end.

5. Adapters for attaching needles to end of tubing. These may be of metal or glass. If of glass they will serve as extra windows as well as adapters.

6. Pinch cocks (Mohr's) for cutting off the flow, to be applied a short distance above the needle.

E. Sterile gauze, cut in small squares, for filtering the solution.

F. Sterile freshly distilled water. This water should be distilled in glass or block tin and should be sterilized immediately by autoclaving or boiling in Erlenmeyer flasks. These flasks should be stoppered with a gauze-wrapped cotton plug and capped with paper or tin foil. Preparation of the water preferably should be carried out on the day before use, so that it will be both fresh and cool at the time needed.

G. Sterile salt solution. This should be made with water prepared as above and chemically pure sodium chloride. Sterilization should be carried out as given above. The strength of the salt solution should be the usual 0.85 per cent. The use of salt solution in the place of distilled water for the dilution is considered a refinement which is not necessary in routine work, but it may have some advantages, since a solution of arsphenamine in distilled water is not isotonic.

H. Normal sodium hydroxide volumetric solution, U. S. P. IX, p. 573. Enough of this can be prepared at one time to last for a month or longer, provided it is kept in a rubber stoppered wax- or paraffin-lined bottle. There is danger of deterioration on account of absorption of CO_2 from the air and of reactions with the glass container. A wax-lined bottle can be prepared by placing wax or paraffin in a bottle, sterilizing with dry heat, and spreading the melted wax by rotation over the inside of the bottle as it is cooling. If precipitate is found in the alkali, it is probably an evidence of deterioration of the solution, which should be discarded. For use in large clinics, a 2-liter bottle, protected from the action of the alkali and of the atmospheric CO_2 , and set up with an automatic measuring burette, is a great convenience and will insure the safe-keeping of the alkali for a long period.

I. Burette or pipette. A graduated burette or pipette for accurately measuring the alkali.

All the glassware mentioned above should be of chemical standard. All apparatus should be surgically clean, freshly sterilized, and cool at time of using. The apparatus should be sterilized by dry heat or autoclave, with the exception of the tubing and the needles, which should be boiled.

IV. INSPECTION OF DRUG.

A. It is a great convenience, and more economical, to employ dosages which are just sufficient to make up the unit batch of solution desired; e. g., if 10 doses of 0.4 gram are made up at a time, use ampules containing 4 grams. An ampule containing 10 doses is the largest that should be used.

B. Examine ampules critically and do not use any which are cracked or in which the powder is not freely mobile and is not of a pale yellow to a lemon-yellow in color.

C. The ampules, having satisfactorily passed preliminary inspection, should be immersed in 95 per cent. alcohol, primarily to detect any minute cracks in the glass not visible on preliminary inspection and also to cleanse the ampule. Lay ampules on sterile towel to dry or wipe off alcohol with sterile gauze.

V. PREPARATION OF SOLUTIONS.

A. The amount to be prepared at one time will depend on the number of patients, but unit batches of more than 10 average doses should not be prepared.

B. Place in Erlenmeyer flasks about 10 c.c. of freshly distilled sterile water for each decigram of arsphenamine to be used; e. g., 100 c.c. for 1 gram. Open ampule and sprinkle—do not dump—contents on surface of water. The temperature of the water is of great importance. For all brands of arsphenamine, except for arsenobenzol manufactured by the Dermatological Research Institute, the water should be at room temperature and, as a rule, the drug should go into solution, with little or no agitation, within a few minutes. A slight amount of shaking is permissible with any product, but shaking should always be kept at a minimum.

(Exception: The arsphenamine manufactured by the Dermatological Research Institute requires either hot water alone, or it can be dissolved in cold water if the powder is first thoroughly moistened with ethyl alcohol (about 1 c.c. to 0.6 gram). In either case it is essential, immediately after contact with the water, to shake the powder vigorously for a few seconds in order to prevent the formation of gummy masses.)

When the arsphenamine has completely dissolved, forming a perfectly clear solution with an absence of any gelatinous particles when viewed by transmitted light, it is ready for alkalization. If for any reason the arsphenamine fails to form a perfect solution, it must be discarded.

C. Correct alkalization is extremely important; failure to alkalize properly causes more reactions than any other error connected with the use of arsphenamine.

1. The exact method consists in the addition all at once of 0.85 c.c. normal sodium hydroxide solution for each 0.1 gm. of arsphenamine used; e. g., 8.5 c.c. for 1 gm. of drug. This is the correct amount necessary to form the disodium salt of arsphenamine, the form which is best tolerated by the patient.

2. Approximate method of alkalization. An exception to the rule that only standardized normal alkali should be used may be made in case this is not obtainable. Under such circumstances, the exact concentration of alkali being unknown, the operator should keep in mind the following facts: Arsphenamine as it appears on the market is the dihydrochloride of the arsphenamine base, which is soluble in water; but the solution is strongly acid and highly toxic. Upon the gradual addition of sodium hydroxide a precipitate at once begins to form and then redissolves. This property of the drug, not understood by some physicians, has caused them to mistake the end point. This mistake is especially likely to occur when the operator thinks he is using a 15 per cent. solution, when in reality the solution is only 4 or 5 per cent. The drug when injected in this still strongly acid state, the monohydrochloride, produces serious reactions.

When a little over one-fourth of the amount of alkali indicated under (1) has been added, the precipitate no longer redissolves. From this point on, until there has been added almost three-fourths of the amount of alkali necessary to form the disodium salt, the precipitate remains and does not redissolve on shaking. But when three-fourths of the total amount necessary has been added, the precipitate redissolves.

It is at this point, when just enough alkali has been added to dissolve the precipitate, that the solution has very frequently been injected. This solution of the monosodium salt is the most frequent cause of reactions. At this point 75 per cent. of the correct amount of sodium hydroxide solution has been added, and hence an additional one-third of the total amount of alkali used up to this point should now be added. This last addition is the remaining 25 per cent. of the correct amount corresponding to a total of 0.85 c.c.

N

per 0.1 gm. of standardized $\frac{1}{2}$ NaOH solution as mentioned

under (1) above; e. g., if 3.3 c.c. of an unknown solution were required for completely clearing a solution containing 2 gms. of arsphenamine, 1.1 c.c. more should be added. With a thorough understanding of the above, the operator may roughly standardize his alkali against the arsphenamine. No two brands of arsphenamine vary greatly in the amount of alkali required, whereas various alkali solutions vary in strength by several hundred per cent.

The P_h of a proper solution is about 10, and it is impossible to buffer it to neutrality by common buffers without precipitation. Moreover, the alkaline solution is well tolerated if given slowly and well diluted.

3. "Haphazard method" of alkalization, or drop method. This is mentioned only to condemn it. It is inconceivable that the operator will be unable to secure some sort of a graduated measuring device in order to measure the alkali instead of guessing at the amount. Numerous reactions from underalkalinization have occurred with this method, particularly where several doses of the drug are prepared at one time. The alkali has been added with a dropper until clearing occurred, and then a few additional drops have been added regardless of whether the solution contained 1 or 10 doses. Less frequently overalkalinization has also occurred. The injection of an overalkalinized solution causes pain along the vein, and thrombosis.

D. Filtration and dilution to proper strength of the alkalinized solution.—With sterile forceps place 4 layers of sterile gauze in the funnel. Wash with sterile water. Pour alkalinized solution of arsphenamine through this gauze into a graduated cylinder and then rinse the filter with enough sterile distilled water to bring the total for each decigram of drug up to 25 c.c.; e. g., for 1 gram of arsphenamine 250 c.c. of solution should be made. This washing of the drug through the filter with the water insures full dosage. If a saline solution is desired, it is used at this point in place of the distilled water, at usual strength, 0.85 per cent.

T. Time the solution should be allowed to stand.—The properly alkalinized, filtered, and diluted solution should now stand for at least 30 minutes before being injected, to allow completion of the chemical reactions. The toxicity is considerably reduced by this delay. The solution may stand as long as three hours without undergoing any increase in toxicity, provided it is protected from the air, not shaken, and provided the temperature does not exceed 30° C. The solution is now ready for administration.

F. Temperature.—Thirty degrees C. is the correct temperature at which the drug should be introduced; in no case should it be warmed above this point.

G. Dosage.—As a rule the initial dose should be small. The average dose used is about 0.4 gram for 150 pounds body weight, but no hard and fast rule can be laid down; each case should be considered individually by the clinician. When a radical cure is being sought and the patient tolerates the injections well, full doses should be given.

VI. ADMINISTRATION.

A. Emphasis should be laid on the complete physical examination preliminary to administering arsenical treatment, for evidence of renal, cardiovascular, or visceral changes, in the presence of which it should be used cautiously. Weekly urinalyses should be made during treatment. The patient should be questioned concerning any reactions following the last treatment, with special reference to any toxic skin eruptions as danger signals against further treatment. Any evidence of an exfoliative dermatitis is an absolute contraindication against any further treatment with any arsenical. Evidence of jaundice should also be looked for and, if present, is an indication for caution. In late cases the possibility of a Herxheimer reaction following a large injection should be remembered. This may be fatal should vital structures be involved. Each patient should receive individual consideration.

B. Preparation of patient.—The patient should be given a mild cathartic the night before and should eat no food within two or three hours before the injection. Only a light meal should be taken a few hours following the injection. Ambulatory patients should rest for a short time after the injection. If large doses are being given, the patient preferably should be kept in bed until the following morning.

C. The patient should be placed in a recumbent position.

D. The gravity apparatus should be arranged to provide a column of solution not over 3 feet in height. The tubing should be rinsed with sterile water; then the cylinder and tubing should be filled with the solution and the air expelled by lowering the end of the tube below the level of the fluid in the cylinder. Apply pinch cock.

E. Select a suitable vein in either arm and sterilize the overlying skin by applying tincture of iodine, which should preferably be removed after a minute or two with 95 per cent. alcohol.

F. Apply rubber turniquet.

G. Insert needle, bevel up, in two stages (first through the skin, second into the vein), and allow a few drops of blood to escape to indicate entrance to the vein. The needle should be slid well into the vein in order to avoid escape of the point from the vein on further slight manipulations. Now connect adapter attached to gravity apparatus. Open pinch cock and snap it over the window.

H. Rate of injection.—If the specifications as to the gauge of needle, etc., have been followed, the correct rate of injection is practically insured, i. e., by the size of the needle and the length of the tube; however, this should not be taken for granted, but the exact time should be observed, and in no case should the rate

exceed 25 c.c. in one minute or 0.4 gram dose in four minutes; five minutes is preferable. A graduated sand glass which runs for five minutes is a convenient timer. The rate of flow should be even as well as slow. Should patient show any signs of reaction, stop. It is highly desirable, in sensitive patients, to wait a minute or two after injection of first 0.1 gram before proceeding with rest of injection. When the necessary amount has been injected, cut off flow with pinch cock, disconnect tubing, allow a few drops of blood to escape, and then withdraw needle and place sterile gauze over the puncture, instructing the patient to hold it there for a few minutes. If another injection is to be given and there is any suspicion of contamination of the tubing with blood, empty cylinder and start over with a new sterile tube.

VII. REACTIONS.

Following the above methods, reactions should be rare. The prevention and treatment of reactions is very important. A discussion of this subject is not undertaken here, except to call attention to general hygiene, diet, foci of infection, dosage, etc., as well as care in preparation and administration of the drug in prophylaxis of these reactions. Patients that continually show immediate reactions should receive prior administration of atropine or divided doses of arsphenamine or combinations of both. In the clinical control of the immediate or nitroso types of reactions, the chief preparation of value is epinephrin 1/1000, about 1 c.c. intramuscularly. This is also of value in the very severe type of reaction—hemorrhagic encephalitis. In the severe types of skin reactions, as exfoliative dermatitis, rapid alkalization of the patient is indicated. In all these delayed types of arsenical poisoning excellent results are said to be derived from the use of sodium thiosulphite given by mouth or intravenously.

Neoarsphenamine

I. LICENSED PRODUCTS.

The following firms have been licensed by the Treasury Department to manufacture or import neoarsphenamine:

A. LICENSED TO MANUFACTURE.

Name of firm and address	Trade name of product
Dermatological Research Institute, 1720 Lombard Street, Philadelphia, Pa....	Neoarsphenamine
Diarsenol Co. (Inc.), Buffalo, N. Y....	Neodiarsenol
H. A. Metz Laboratories (Inc.), 122 Hudson Street, New York City....	Neosalvarsan
Powers - Weightman - Rosengarten Co., Philadelphia, Pa.	Novarsenobenzol Billon
E. R. Squibb & Sons, New Brunswick, N. J.	Neoarsphenamine

B. LICENSED TO IMPORT.

Farbwerte, vorm. Meister Lucius und Brüning, Hoechst-am-Main, Germany	Neosalvarsan
Poulenc Frères, 92 Rue Vieille-du-Temple, Paris, III, France.....	Novarsenobenzol

II. METHOD OF INJECTION.

The use of the gravity method is strongly recommended, especially in clinics where a considerable number of doses are to be given. It was demonstrated in one clinic that the average time required to give 100 injections was reduced, without changing the personnel, when the gravity method was substituted for the syringe method, and a high percentage of reactions, due directly or indirectly to the syringe method, also ceased to occur. With the gravity apparatus arranged to deliver a dose in about four minutes, one operator was able to run two tables much more easily than one table with the syringe method.

It is recognized, however, that there are circumstances in which the syringe method is indicated, as in the field, where apparatus must be reduced to minimum. Under these circumstances the use of neoarsphenamine by the syringe method is a valuable therapeutic measure. It fills a need, but technically is inferior to the gravity method; and, therapeutically, neoarsphenamine given by either method is inferior to arsphenamine given by the gravity method.

III. APPARATUS REQUIRED.

A. When the gravity method is to be used:

1. Gravity apparatus (see Arsphenamine, III-D).
2. Erlenmeyer flasks, 50-300 c.c.
3. Funnels, glass, 2-inch.
4. Sterile gauze.
5. Graduated glass cylinders, 100 to 500 c.c.
6. Sterile distilled water (see Arsphenamine, III-F).
7. Saline, 0.85 per cent. (see Arsphenamine, III-G).

B. When syringe method is to be used:

- As above, except in place of gravity apparatus.
1. 10 to 50 c.c. all-glass syringes.
 2. Rubber tubing, short, with adapters connecting syringe and needle.
 3. Needles, 25 standard gauge, medium bevel.

IV. INSPECTION OF DRUG.

An even more critical examination should be made than in case of arsphenamine, as neoarsphenamine occasionally decomposes in the ampule, even when no cracks are present. The powder should be freely mobile and lemon-yellow to canary-yellow in color. When it approaches a red color, is distinctly lumpy or solidified, do not use.

Immerse in alcohol the ampules which have passed inspection, to further eliminate the presence of cracks and to clean the ampule.

V. PREPARATION OF SOLUTION.

A. Amount to be prepared at one time.—In marked contrast to the practice with arsphenamine, do not prepare any more solution at one time than can be administered within 20 minutes.

B. Concentration.—Preferably, 1 decigram should be dissolved in 12.5 c.c. of water. This solution is then twice as concentrated as an arsphenamine solution. Concentrations as high as 1 decigram in 0.5 c.c. of water can be used in the field, or under other special circumstances. The highly concentrated solutions, however, should be given very slowly.

C. Solution:

1. Put in Erlenmeyer flask 12.5 c.c. sterile distilled water for each decigram of neoarsphenamine. In the field the concentrated solution can be made in the ampule itself by using water supplied in another ampule. (*Caution:* The distilled water used must be at room temperature and not to exceed 30 degrees C.)

2. Open ampule and sprinkle—do not dump—powder into the water and, by preference, allow it to go into solution with no agitation whatever. Slight rotation of the flask is permissible. *Shaking the solution increases its toxicity and should be avoided.*

IN CASE THE SOLUTION IS NOT PERFECTLY CLEAR AND TRANSPARENT, IT SHOULD UNDER NO CIRCUMSTANCES BE USED. WHETHER IT REQUIRES ONE MINUTE OR TEN MINUTES FOR THE DRUG TO FORM A PERFECT SOLUTION IS UNIMPORTANT, BUT IT SHOULD NOT REQUIRE MORE THAN TEN MINUTES. THE IMPORTANT POINT IS, NOT THE RATE OF SOLUBILITY BUT THE COMPLETE SOLUBILITY OF THE DRUG.

3. As soon as the neoarsphenamine is in solution, filter through washed gauze into tall, narrow cylinders and keep stoppered. It is preferable to use a size of cylinder which the solution will nearly fill. The smaller the air column over the solution the less the danger of increased toxicity. The solution is now ready to inject, and, in marked contrast to the arsphenamine solution, which should stand at least 30 minutes before its injection, the neoarsphenamine solution should be injected *immediately*, and in no case shall it be allowed to stand longer than 20 minutes.

4. Dosage.—The initial dose, as a rule, should be small. The average dose is about 0.6 gram for 150 pounds body weight; but no attempts to lay down a hard and fast rule in this regard are made. The patient must be individualized.

VI. ADMINISTRATION.

The directions made under arsphenamine to apply the administration of neoarsphenamine, with the exception of the dosage, rate, and method of administration.

Rate.—If instructions have been followed, the proper rate is practically insured by the character of the apparatus, but it must be checked by using a time-piece, and in no case, whether the gravity or the syringe method is used, should more than 0.1 gram of neoarsphenamine be injected in 30 seconds, or 0.6 gram in 3 minutes. This time is one-half that required for arsphenamine. In giving concentrated solutions, especial care is necessary in order to carry out this rule.

ARSPHENAMINE.

Recations are usually due to errors in technique or failure to adapt treatment to needs of patient. Arsphenamine is preferable to neoarsphenamine.

I. Use any properly licensed product.

II. Use only the gravity method.

III. Materials needed.—Erlenmeyer flasks, glass funnels, graduated cylinders, sterile gauze, sterilized freshly distilled water, normal sodium hydroxide solution, graduated pipette or burette, and gravity apparatus, consisting of 300 c.c. gravity cylinder, pure gum rubber tubing about 40 inches length, diameter $\frac{1}{8}$ inch, end adapter, glass window, slip needles, 19 standard gauge, 1½-inch cannula, medium bevel, and pinch cocks.

IV. Inspection of drug.—Record name and lot number; note especially dosage, color, and mobility of powder. If ampules are cracked, or if powder is other than pale yellow to lemon color and not freely mobile, do not use.

V. Preparation of solution.—Prepare not more than enough for 10 patients at one time.

A. Immerse ampules in alcohol.

B. Place in Erlenmeyer flask about 10 c.c. distilled water at room temperature for each 0.1 gram of the drug to be used,

(Continued on page 251)

The Medical Times

A MONTHLY JOURNAL
OF

Medicine, Surgery and the Collateral Science

ESTABLISHED IN 1872

EDITED BY

H. SHERIDAN BAKETEL, A.M., M.D., F.A.C.P.

ARTHUR C. JACOBSON, M.D.

Associate Editor.

Contributions.—**EXCLUSIVE PUBLICATION:** Articles are accepted for publication on condition that they are contributed solely to this publication.

When authors furnish drawings or photographs, the publishers will have half tones and line cuts made without expense to the writers.

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UNITED STATES	\$2.00 per year
(Including Alaska, Cuba, Mexico, Porto Rico, Hawaiian and Philippine Islands)	

CANADA	\$2.25 per year
FOREIGN COUNTRIES IN POSTAL UNION	\$2.50 per year

SINGLE COPIES, 20 CENTS

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All communications should be addressed to and all checks made payable to the publishers.

MEDICAL TIMES CO.

ROMAINE PIERSON, President

H. SHERIDAN BAKETEL, Treasurer

GEORGE B. CREVELING, Secretary

95 Nassau Street

New York

NEW YORK, SEPTEMBER, 1922

G. B. Creveling Joins The Times Staff

George B. Creveling, for a quarter of a century identified with the *Medical Record* as advertising manager, has been elected secretary and one of the directors of THE MEDICAL TIMES and in future will be in charge of the advertising of this journal. Mr. Creveling is one of the best known men on the business side in the medical journal field. A keen solicitor, an eminently fair competitor and a polished gentleman, he has ever commanded the respect of his confreres and his clients. Mr. Creveling needs no introduction to the advertising patrons of THE MEDICAL TIMES, but like all modest men he has kept his personality in the background and for this reason this brief word of introduction to the medical profession is presented. The directors feel that they are to be congratulated upon the accession of Mr. Creveling to their number and they doubt not that his association with them will result in a marked strengthening of THE MEDICAL TIMES business department.

The editor has been elected treasurer of the company, resigning the secretaryship in favor of Mr. Creveling.

A Frequent Surgical Oversight

The nutritional condition of children is not taken sufficiently into account, in many cases, before subjecting them to operative procedures of one kind or another. Of course, one thinks first of adenoid and tonsil operations, but the same criticism holds good in other surgical circumstances.

This failure to take nutrition into account accounts for many of the failures, both grave and

minor. The under-nourished child is not a fit subject for surgery that is not of an emergent character. Much of the malnutrition that is blamed on the tonsils and adenoids, and which has perhaps been made an excuse for surgery, is dietetic in origin, and the operative work does nothing but unmitigated harm.

What wonder that accidents and complications occur in these poorly selected subjects? What wonder that a year after the operation that was going to improve their health we find them in miserable condition?

For the failure to take nutrition into account also applies to neglect of the child's dietetic requirements after the operation, his nutrition remaining uncorrected, with a corresponding vulnerability to apparently mysterious infections.

The truth of the matter is that in a very great number of cases, if nutritional needs were looked to, the child's condition and resistance would become such that a projected tonsillectomy or adenectomy would fade far into the background.

If a child's nutrition and resistance were carefully considered and developed it is our conviction that the common run of chronically infected throats would either not occur, or, if occasionally met with, would clear up or become relatively if not wholly innocuous without operative intervention.

Genius and Health

In his "Health and Social Progress," Professor Binder of New York University expresses the conviction that the great genius who achieves a high order of creation must of necessity be healthy. In the first place true genius is sane, because it is healthy; to be sane, the genius must be healthy.

If, says Professor Binder, we look at the great masterpieces of art, literature, philosophy, and science, produced by the handful of ancient Athenians (those other than slaves never at one time numbering more than 50,000), we cannot escape the conclusion that the believers in the principle of "a sound mind in a sound body" must have been right. Ultimately the physically most perfect man must have the best mind.

A new conception of the genius as the physically best-equipped man instead of that of a degenerate or insane person is offered by Professor Binder. He believes that the geniuses who suffered did not produce because of suffering, but in spite of it, by virtue of their strong vitality and finely organized brains. Their works would have been more perfect and wonderful had they enjoyed uniformly good health.

The majority of socially useful men, according to Professor Binder, have been strong and healthy. They were neither insane nor degenerates. In every case there was at least sound structure. Disregard of hygiene, in the past, and the seeking of relief in various vices as an after effect of tremendous strains incident to creative effort, account for some of the over-emphasized disabilities of certain geniuses.

In short, the exertion in creating something new always involves a great strain which only men with good vitality are able to endure. The high tension and heavy expenditure of vitality involved in the work of men like Wagner imply superb endowment, despite functional or organic ailments.

The professor discusses a considerable number of famous men of genius in detail, and shows that their health was generally at least good, and in most cases excellent. The prominent men at German, French,

English, and American universities are usually healthy, if not robust.

Balance of mind, ability to compare and to judge accurately and to synthesize, and self-control, are only possible, in the view of Professor Binder, on the basis of good health. Extraordinary power for synthesis if the synthesis is to be coherent and applicable to life, especially requires a high degree of vitality. This power is characteristic of the genius. Intellectual conflict with vast masses of ideas, long sustained, with useful productions proportionate to the work involved, is the most exhausting of human activities. A Newton's hours of struggle with original problems would put an ordinary man out of action in five minutes. The physical and mental exertions of Wagner in writing his twelve operas and designing the costumes and decorations for them must have been almost superhuman.

Today the genius who is wise does not disregard the laws of hygiene. He knows that a clear mind, keen perceptions and intellectual discipline demand good care of the health.

Even Lombroso, with his mania for convicting geniuses of insanity or degeneracy, writing of Galileo, Leonardo da Vinci, Voltaire, Machiavelli, Michelangelo and Darwin, has to admit unswerving power that must have had its roots in a vast vitality. For he writes: "They never changed their faith or character, never swerved from their aim, never left their work half completed. What assurance, what faith, what ability they showed in their undertakings; and, above all, what moderation and unity of character they preserved in their lives! Though they, too, had to experience—after undergoing the sublime paroxysm of inspiration—the torture inflicted by ignorant hatred, and the discomfort of uncertainty and exhaustion; they never, on that account, deviated from the straight road. They carried out to the end the one cherished idea which formed the aim and purpose of their lives, calm and serene, never complaining of obstacles, and falling into but few mistakes—mistakes which, in lesser men, might even have passed for discoveries."

A Losing Race?

Raymond B. Fosdick propounded an interesting question in a recent commencement day address. "Will man continue the master of the intricate machinery of civilization or will it prove a Frankenstein monster that will slay its own maker?"

Mr. Fosdick concerned himself chiefly with the infinitely complex and technical government that we have today, having to do with matters which are far beyond the intelligence of the average citizen. He showed that the breach between the citizenship and its government is widening as science increases the complexity of its operations. The situation has got beyond us. We cannot comprehend its rapidly extending technical aspects, much less control the government that directs our destiny.

Even if there were time and machinery for the education of the majority of people in these matters, Mr. Fosdick does not believe that an intelligent conception of them could be developed, since man's capacity does not keep up with his inventions. While our environment has been tremendously advanced there has been no corresponding improvement in the human stock. "We have come into our inheritance with no greater abilities than our grandfathers had."

"Life in the future will be speeded up infinitely beyond the present. . . . Science will not wait for

man to catch up. It does not hold itself responsible for the morals or capacities of its human employers."

It would seem that education cannot run fast enough to overcome the lead which science has obtained, much less keep abreast in the race.

These remarks of Mr. Fosdick seem to be an echo of what is being said and written about the impossibility of comprehending all the great advances that are being made in the field of medicine with startling rapidity and in every quarter of the globe, not to speak of applying them in practice. It is sometimes said that tremendous gains in the public health could be effected if the people could only be induced to realize the social potency of our untried hygienic and sanitary knowledge, but it is forgotten that the profession itself does not realize it either—cannot realize it.

The swamping exuberance of our attainments precludes their proper understanding and paralyzes action. There is bewilderment instead of effective function. And as we stand in confusion the vast welter of new knowledge is piling further up, until no man can foresee the end.

It seems, forsooth, very like a Frankenstein.

Dr. George M. Gould

The passing of Dr. George M. Gould removes from the field of medicine one of its most picturesque and progressive workers. Widely known as an author, fearless in his exposition of what he believed to be right, Dr. Gould long ago made a very definite place for himself in his profession. He will be remembered, if for nothing else, for his work on eye strain. Dr. Gould was widely ridiculed for his statements in this connection in the early days of his labors, but today it is recognized that he discovered something of the greatest benefit to mankind. Medical journalism loses a bright and shining light in the passing of Dr. Gould and the profession at large is the poorer by his departure.

Miscellany

CONDUCTED BY ARTHUR C. JACOBSON, M. D.

Long Live the King!

And what will become of our specialism? Where will it end? Will there be need for its regulation and control? Undoubtedly the existence of specialties is the proof of their necessity, and their development has been the crowning achievement of modern medicine. But increasing subdivisions of specialism give us pause, so much so that by reaction we are beholding a newer specialist—the general practitioner. He is in a class by himself, left in charge of those who are actually sick, with the issues of life and death on his hands, both early and late. He is the keystone of the medical arch; without his support the whole fabric would fall; family after family are depending on him for counsel, relying on his judgment in every crisis. Of what use are specialists unless there is the intermediary to say when they are needed? And since the general practitioner has by distinction become a specialist and expected to know a little about everything, why should not the professed specialist be required to know something of general medicine? One finds oneself somewhat in agreement with the recently suggested proposal that examining boards may require five years in general practice before allowing the privilege of going into a specialty. How else may be curbed the tendency

to divide the body into compartments for exclusive attention without a working knowledge of the whole system? These questions also will furnish their own answers.—Hubert A. Royster, M.D., *J.A.M.A.*, Aug. 5, 1922.

One Layman's View

The real pest among reputable physicians is the young man who expects his patients to pay for his needlessly high overhead expenses. He may be known by his spacious and elaborate offices and waiting rooms, buttoned door boys, sleek secretaries, fluttering office nurses and powder monkeys of both sexes, and an all pervading shimmer of white enamel, mechanical novelties and glittering metal work. Not infrequently the young practitioner who indulges in all these fripperies is trying to put over a poor piece by costly stage effects. He sometimes forgets, and his patients still oftener fail to realize, that what he really has for sale resides in his own cranium, and that mere style, atmosphere and scenery are poor substitutes for knowledge, experience and technical proficiency.—*Saturday Evening Post*.

(Continued from page 248)

open ampule and sprinkle powder—not not dump—on surface of water, allow to go into solution with little or no agitations.

Exception.—Arsenobenzol (D. R. I.) requires for rapid solution either the use of hot water alone or cold water after having been previously moistened with ethyl alcohol (1 c.c. to 0.6 gm.). In either case immediate, vigorous shaking for a few seconds is essential to prevent the formation of gummy masses. After shaking, wait for complete solution and cooling.

C. Alkalization.—When solution is complete, add 0.85 normal alkali (U. S. P.) for each 0.1 gram of drug (e. g., 1 gm. requires 8.5 c.c.). When standardized normal sodium hydroxide is not available, see detailed instructions for procedure. *The drop method of measuring the alkali should never be used.*

D. Filtration.—Filter the clear, alkalized, amber colored solution through sterile gauze, four-ply, previously washed out with distilled water, into a graduated cylinder (not the gravity cylinder).

E. Dilution.—Dilute with distilled water so that 0.1 gram arsphenamine is contained in 25 c.c. (e. g., 100 c.c. contains 0.4 gram).

F. Time of standing.—The filtered, perfectly clear, alkalized and properly diluted solution should now stand for 30 minutes before being injected.

G. Dosage.—The initial dose should be small. The average dose is about 0.4 gm., but in this respect each case should receive individual consideration. For radical cure, full doses are indicated.

VI. Administration:

A. Preparation of patient.—In each instance attention should be given to the physical condition, effects of previous treatments of arsphenamine, etc.

B. The use of gravity apparatus, with level of fluid 3 feet above the vein, and 19 gauge needle should give proper rate of injection. However, it should be checked by a time-piece and not more than 25 c.c. (0.1 gm. of drug) should be injected per minute. It is advisable to take about 5 minutes for injection of the average dose (0.4 gm.).

NEOARSPHENAMINE.

I. Use any properly licensed product.

II. The gravity method of injection is strongly recommended, in view of the fact that reactions have occurred much less frequently in large clinics using this method as compared with large clinics using the syringe method. The syringe method, however, is a valuable one especially in the field. If the syringe is used, it should be with a 25-gauge needle connected to the syringe with a short piece of rubber tubing.

III. *Materials needed.*—Gravity apparatus, as for arsphenamine, or 10 to 50 c.c. all-glass syringes, with 25-gauge needles and short rubber connections. Erlenmeyer flasks, funnels, sterile gauze, cylinders, and sterile freshly distilled water.

IV. *Inspection of drug* is even more important than in case of arsphenamine, as neoarsphenamine may, under certain conditions, change in the ampule. Note manufacturer, amount contained, and especially color, mobility, and bulk of the powder. If ampules are cracked, or if powder is other than canary yellow and not freely mobile, do not use.

V. Preparation of solution:

A. Immerse ampules in alcohol.

B. Place in an Erlenmeyer flask, 12.5 c.c. of distilled water for each 0.1 gram of the drug to be used, and sprinkle—do not dump—powder on the surface of the water. Allow it to go into solution without shaking. Slight agitation by rotating the flask is permissible. *Shaking increases toxicity.* While in the field and under special circumstances a concentration as high as 0.1 gram in 0.5 c.c. of water can be used, the use of 12.5 c.c. to each 0.1 gram is strongly recommended. Discard any product which is incompletely soluble.

C. *Filtration.*—Filter the perfectly clear solution through washed sterile gauze into a narrow graduated cylinder.

D. *Time of standing.*—Neoarsphenamine solutions, in marked contrast to arsphenamine solutions, should not stand but should be given at once, and in no case should they be allowed to stand for more than 20 minutes. If any haziness or clouding occurs, do not use.

E. *Dosage.*—The initial dose should be small. The average dose is 0.6 gm., but in this respect each patient should receive individual consideration.

VI. *Administration.*—Pay particular attention to preparation of patient and to rate of injection, which must not exceed the introduction of more than 0.1 gm. of neoarsphenamine in 30 seconds, whether the gravity or the syringe method be employed. The rate may be almost perfectly controlled by the use of the gravity apparatus specified. With the syringe method the use of the small sized needle specified and the short rubber tube connector will enable one to inject sufficiently slowly without great difficulty, although greater care is necessary than with the gravity method. The rate should be frequently checked with a time-piece.

The Physician's Library

Health and Efficiency, by Thomas Darlington, Ph.B., C.E., M.D. 262 pages. New York: Wynkoop, Hallenbeck, Crawford Co., 1922.

There is no dearth of material, along the lines of hygiene, with which authors hope to educate the public so that efficiency and prolonged life shall result. As a matter of fact it is exceptional to find a newspaper whose circulation is above the ten thousand mark, which does not have on its staff, either as a special writer or as one of its editors, some one from among the ranks of the medical profession. Laymanistic periodicals likewise devote much space in attempts to educate the public on the subject of Health, some of their contributors being medical practitioners of note. How much real worth can be attributed to these efforts to enlighten the minds of old and young so that their physical needs may be clearly set forth, is problematic. Not because the intent is not good, but because the method in which the mission is carried out lacks in essentials to make it effective.

The author of *Health and Efficiency* has a vast personal experience in matters of this kind to aid him both as to conclusions and to methods. He has filled very many positions, professional and otherwise, in which the study of health and efficiency constituted the crux of his duties. Both as medical adviser and as champion of quasi-medical endeavors, he has come in contact with almost every phase of proposed procedures purposing the physical betterment of the public. Thus surcharged with prerequisites for gathering, annotating and making deductions from a wealth of material, the author had a foundational knowledge for the task in hand which served him well.

One factor in this work stands out prominently and should serve as an example to writers generally who wish to convey a message, professionally grounded, to the laity. The author has not talked over the heads of his audience. His language is plain, the sentences are uninvolved and there is no attempt to theorize needlessly.

The benefit of physical examination, at least once a year, is stressed. There is nothing novel in this suggestion, but the laity needs this admonition and its place in a work of this kind is desirable.

The features of the book that are particularly noteworthy are contained in the chapters on the care of the various organs of sense and on the care of the feet. Modern life, with its varied and exacting demands along the lines of efficiency, has measurably increased the uses to which the organs of sense are being put. And so the need for care in safeguarding the eye, so that sight may not be prematurely impaired, in anticipating possible conditions affecting the ear, the nose, the mouth, the teeth and the throat—all of these are dwelt upon in a practical manner and with incisiveness.

The chapter on the care of the foot is brief but meaty. It points out the evils of "civilized" foot-gear, gives advice as to shoes and stockings, and warns against delay when weak foot, the precursor of flatfoot, seems in evidence. Medical schools and

physicians probably need more advice on this subject than the layman. The care of the foot has been a negligible factor in medical teaching and in medical practices for all the centuries. It is high time that the profession of medicine insists upon foot-care being a part of the regular curriculum of the medical school or that they give their ungrudging support to those who are attempting to develop podiatry as a specialty in medicine.

The only medical doctors who profess to know anything about foot care are the orthopaedic surgeons, and they do not bother with minor foot conditions. Even if they did there are not enough of them to meet the demands of the public for foot-care. War statistics and surveys made among school children show an amazing percentage of foot impairment—probably 50 per cent. of all classes, old and young, being sufferers. Eliminate the elements of suffering and of progressive disease tendencies because of this data, and think merely of the nation's impaired efficiency by reason of such a condition of affairs, and it becomes clear that both the profession and the public should be made cognizant of the needs of the situation. Some of the byproducts of drugs have become more important factors in the pharmacopoeia than are the parent medications. And so it is coming to pass that podiatry (scientific foot care) will be a specialty in medicine of no mean proportions.

The author sets forth the "Influence of Mind over Body" in admirable style. The simple examples he recites are thoroughly apropos and should make an impression on many readers who are tinged with faith views of the miraculous order, as bearing upon results easily ascribable to natural laws and conditions, instead of to the extraordinary.

Dr. Darlington has a large circle of influential friends. Some of these latter are captains of finance, who are on the alert for avenues through which to serve as humanitarians. If Health and Efficiency could be placed in the hands of every thinking parent, through an influence of this kind, it would serve a splendid purpose in bringing home to the laity a group of facts which would prove helpful in preventing disease and in prolonging life.

M. J. L.

Diagnosis and Treatment

Aural Sepsis

W. Stuart Low, of London, believes tuberculosis one of the most troublesome conditions to alleviate, which is sometimes incurable when thoroughly established, is that, not unusual in young children, due to the tubercle bacillus. It often lasts for months, or even years, and ends in extensive destruction of bone, or the fatal meningitis. There is invariably a very profuse thick purulent discharge, often pouring down from the external auditory meatus over the face and neck causing eczematous excoriation and incrustation, altogether a most unsightly mess. Not infrequently there is no pain; this is somewhat difficult to explain unless it is that, since the discharge gets away so freely, there is less damming up or tension. A special alcohol, having an anaesthetic effect, is said to be generated in the mucous membrane of the ear in this affection, but this is not now generally accepted as an explanation of the absence of pain.

Facial paralysis is not rarely seen in children so affected, owing to the extension of the disease to the aqueduct of Fallopian and pressure on the nerve or periostitis in the bony canal of the aqueduct. The cervical glands are often enlarged and nodular, so that, especially after a bacteriological examination, the diagnosis should be quickly achieved.

As in acute otitis media and in gonorrhoeal otitis too great stress cannot be laid on the great importance of a bacteriological examination of the curedtted material and granulations removed from the middle ear, as well as on experimental inoculations. Clinically, a family history of tuberculosis will often be elicited, as in the case of a young child of three years of age with long-standing aural discharge in which the tubercle bacilli had been found. The author has no doubt that in this case the ear trouble was the result of direct digital infection or of infection through the Eustachian tube from the throat, since, on visiting the child's home, he found the father bed-ridden in the last stage of pulmonary tuberculosis. He had a severe hacking cough and a very profuse purulent expectoration. Since a family of four young children with the father and mother occupied only two small adjoining rooms, it will easily be understood how infection, direct or digital from sputum off the floor, or indirectly through the mouth, naso-pharynx, and Eustachian tube, may have occurred. While the bacteria causing the usual aural discharges such as staphylococci, pneumococci, streptococci, and gonococci can readily be identified in the discharges, the tubercle bacillus is very difficult to find and often cannot be found at all. Dr. Wyatt Wringrave in his research emphasized this difficulty, and even in material curedtted from the tuberculous cavity of the tympanum,

the result of examination is often negative. This is very remarkable when we remember the readiness with which tubercle bacilli can be found in phthisical sputum. In acute aural cases, it is, however, easier to find the tubercle bacill. There is little doubt that tubercle bacilli are often conveyed to these children in unsterilized milk, for the great majority occur among bottle-fed as distinguished from breast-fed children.

Statistics of Drs. Turner and Fraser prove that below the age of two years 27 per cent. of the cases of purulent otitis media are due to tuberculosis, and under one year 50 per cent. of cases are due to tuberculous disease. Tuberculous otitis media also occurs in the more advanced conditions of pulmonary consumption. Drs. Turner and Fraser met with five cases of otitis media in 120 cases of phthisis; but in only one of these was the condition of the middle ear tuberculous. Low has records of 10 cases of purulent otitis media in phthisical subjects, in all of whom the tubercle bacilli were identified. These were all in adults, and the discharge was of long standing.

Primary tuberculosis of the meatus of the ear has been reported as a result of direct digital infection. Owing to the habit of children of putting their fingers into all kinds of places and then into their ears, the infection is usually very mixed; but the commonest routes of infection are two: the channel of the Eustachian tube, the most frequent, and through the blood-stream.

Clinically, aural tuberculosis may be acute to chronic; in each, the changes in the ear will range from mere infiltration of the mucous membrane to well-defined necrosis of the temporal bone, with rapid caseation and destruction of all structures. This may even include the exfoliation of the entire labyrinth, as shown in a specimen removed by myself through the meatus in the case of a child of three years.

As regards treatment, Low has seen very good results from persistent local application of tincture of iodin, beginning with the mitigated and then after a week using the strong B.P. tincture, freely in the meatus in the form of a spray. Treatment must not only be local and operative, but also conducted on general lines, and attention should be directed to prevention. The milk supply should be carefully seen to, the milk examined for tubercle bacilli, the dairy from which the milk is obtained inspected, and the tuberculin test applied to the cows. Locally, cleanliness is the most important point of the treatment, the profuse discharge being regularly cleared off by wiping and mopping out the meatus and ear with boracic wool on probes, and the cavity of the tympanum sprayed and sponged out with tincture of iodin, which is introduced into the ear with a coarse glass spray or pipette. The author has had the best results from the use of tincture of iodin even in very old standing cases. On no account should the ear be syringed, for this only serves to force the sepsis further and deeper into the osseous accessory recesses.

As regards the operative treatment of tuberculous otitis media, granulations should be removed, the carious bone curedtted, and necrosed pieces extracted. If the disease has extended to the mastoid, a thoroughly complete coricid mastoid operation may become necessary. The rule laid down by Polizer is a good one, viz., not to operate if the ear trouble developed secondarily to the lung disease, but, if the ear first became affected, operation is advisable.

It is well to keep in mind that in all such cases operation may become imperative at any moment from the threat of serious complications, such as meningitis, or extension of the trouble backwards to the mastoid; moreover, we should never overlook the necessity for the almost always advisable operation of the enucleation of the septic and often tuberculous tonsils and removal of adenoids, the neglect to do which is one of the principal reasons for failure to effect a cure.

Besides paying most assiduous attention to local treatment and cleanliness, it is well to see to the dietary by giving fresh uncooked or slightly steamed vegetables, and salads; and there should be a liberal allowance of fresh uncooked fruit and cod-liver oil. The patient should be kept as much as possible in sunlight and fresh air, at the seaside if possible, but sea-bathing, as a rule, should be prohibited.—(*The Practitioner*, July, 1922.)

Gonorrhœa. A Review of 1921 Literature.

Symptomatology.—Sagot has collected the reports of 45 cases of gonococcal endocarditis, including one observed by himself and Hallé. He concludes that gonococcal endocarditis may be benign or vegetative; that the benign form is more common than is generally supposed, and is a probable cause of chronic cardiac disease; that the vegetative or ulcerative, form has the character of an acute septicaemia with cardiac symptoms and is usually fatal; that the danger of septicaemia increases with extension of the disease to the deeper genito-urinary organs, but bears no definite relation to the severity of the primary infection.

Rivaz describes a case of the rare complication of gonorrhœa, keratoderma blenorragica. The patient was treated with per-

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manganate irrigations and a polyvalent vaccine. The condition cleared up about two months after its first appearance.

Citron reports a case of gonococcal septicaemia which was cured by sub-cutaneous injection of 50 c.c.m. of meningococcal serum. He refers to cases reported by other observers which benefit by meningococcal serum—acute gonorrhoeal affections of the internal genital organs in women by Le Masson, and gonorrhoeal arthritis by Barlee, and concludes that this serum is indicated in all severe cases of general gonococcal infection.

Weill and Colaneri report another case of gonococcal septicemia. Symptoms of septicemia developed in a man during the acute stage of gonorrhoeal urethritis. Treatment by intramuscular injections of electragol and afterwards by anti-meningococcal serum and an autovaccine has no effect. Patient died a month after symptoms of septicemia commenced.

Valentin remarks on the frequency or relapses in gonorrhoeal vulvovaginitis in children. In his 161 cases the chief source of relapse was found to be the rectum.

Diagnosis.—Norris and Mickelberg give an analysis of 794 examination of films (Gram's) from women presenting clinical evidences of gonorrhea. They believe that clinical evidence is of greater value in diagnosis than staining methods. Minor details of technique are given.

Prophylaxis.—Schumacher prefers albargin to protargol, hegemon, or other silver preparations, as it contains a high percentage of silver, and can, therefore, be used in weaker solution. A 1 per cent. solution is considered a sufficient prophylactic against the gonococcus. As in the case of mercury, solutions of silver salts must contain silver ions in order to be effective. Schumacher points out that perchloride of mercury acts as a prophylactic against both the spirochete and the gonococcus, and can hence be used alone. The chief object to general use is its poisonous property. He therefore suggests the use of 10 per cent. solution of albargin as a general prophylactic, and holds that the silver ions have also a bactericidal action against the spirochete.

Treatment.—Phélix claims good results from silver ionization in the early stages of gonorrhoeal urethritis. He gives method of treatment used.

Haxthausen quotes the investigations of Eizenberg and Okolska (Zentralbl. f. Bakter., 1st Ab. Orig. 1913, 69, 312) as having shown that the action of certain disinfectants can be greatly increased by the addition of even small quantities of alcohol. He compares the results of his 100 cases of acute uncomplicated and mild complicated gonorrhoea treated with a solution of protargol (0.5 per cent.) and alcohol (5 per cent.) with Jersild's (Ugesk. f. Laeger., 1913, 961) report on 116 cases treated with a watery solution of protargol followed by a watery solution of silver nitrate later in the disease. Haxthausen finds this comparison favorable to his treatment.

In a subsequent paper, Jersild, who has treated 14 cases of gonorrhoea of the urethra in women and of vulvovaginitis in children with alcoholic solutions of protargol and has compared the effects with those obtained in twenty other cases treated with a watery solution of protargol, has nothing good to say of the former method.

Mann advocates acriflavin for the irrigation of gonorrhoea.

Oettinger and Deguingand report on eight cases of gonorrhoeal arthritis treated with anti-gonococcal serum. The results obtained by intra-articular injection were much more rapid and effective than when the serum was injected sub-cutaneously.

Scherliess claims good results with hot water irrigation in gonorrhoea in soldiers. He gives his treatment used in 200 cases with only three failures.

Lindblad has tested the value of milk injections in gonorrhoeal disease of the eyes by a statistical comparison of the results obtained at the Sabbatsberg Hospital before and after the introduction of this treatment, which for the past year and nine months had been adopted in every case of gonorrhoea of the eyes. Author concludes that this treatment is beneficial in some cases but it does not deserve extravagant praise.

Terrien, Debré, and Paraf have studied the effect of anti-gonococcal serum by experiments on the rabbit. From the results obtained the authors are of the opinion that anti-gonococcal serum, to be effective, should be injected into the actual focus of disease. This, however, does not apply absolutely to the effects of serotherapy in the human subject.

Sagot regards sub-cutaneous or intravenous injection of anti-gonococcal serum as the most promising form of treatment in cases of gonococcal septicæmia. He mentions the experiments of Debré and Paraf with this serum in animals.

Reenstierna reports favorable results from the treatment of gonorrhœal complications by a combination of anti-gonococcus serum and a temperature-rising agent.

Sézary discusses the variable results of anti-gonococcal vaccination. In conclusion he remarks that we must not expect too much from vaccinotherapy. Its role is to stimulate and rein-

force the reaction of immunity, but this reaction may be slow and insufficient.

Boyd has investigated the value of vaccines in acute gonorrhœa. Comparing 270 cases treated with vaccines with 200 control cases treated without them, it was found that the vaccine had no effect on the course of acute gonorrhœa.

Demonchy advocates the use of vaccines in acute gonorrhœal urethritis. From his experience he concludes that intravenous injections of antityphoid vaccine give the best results. He thinks that the specificity of the vaccine plays only a secondary part in the treatment of the complications of gonorrhœa, and that the therapeutic results are not proportional to the dose injected. He advises small doses repeated not later than five or six days.

Weill reports favorable results from the sub-cutaneous injection of hydrocele fluid in cases of gonococcal epididymitis complicated with hydrocele. Three cases are reported, in the first of which two injections of 10 c.c.m. were given, in the second one of 5 c.c.m., and in the third one of 3 c.c.m. The first case improved most rapidly and Weill considers that the therapeutic effect is proportional to the quantity of liquid injected. Weill also obtained improvement in two other cases of gonorrhœal epididymitis by injections of hydrocele fluid from the first case—hetero-plasmo-therapy.

Cumming and Glenn recommend vas puncture and injection of collargol in cases of acute and chronic seminal vesiculitis. Their method of treatment is given. As the result of an experience with 55 cases the authors conclude that this is an effectual method of treatment of gonorrhœal infection of the seminal vesicles; that it should be combined with the usual treatment for associated conditions of urethritis and prostatitis; that vas puncture is contraindicated in cases with acute anterior urethritis or acute epididymitis; that while not a certain cure, it leads to improvement in most cases, and to cure in some.

Tests for cure of gonorrhœa.—Fraser warns against over-treatment and over-instrumentation. He concludes that there is no absolutely certain test for cure, but gives scheme which he considers practical and sufficient. With regard to the complement fixation test, he thinks that more knowledge of the different types of gonococci and a more sensitive antigen are required before the test can be rendered reliable.

Volarelli, who has investigated the tests for cure of gonorrhœa from the results of 172 cases, considers that the best test consists in provocative injections of gonococcal vaccine, together with bacteriological and cytological examination of the secretion.

Herrold has attempted to establish a more definite standard of cure in gonorrhœal infections in the male by improved methods for cultivation of the gonococcus, and by study of the value of provocative and serological tests. He concludes that cultures of prostatic and seminal secretions and the first urine sediment furnish the most reliable means of determining whether a gonorrhœa is cured.

Urologic Diagnostics in Small Children

When, in March, 1911, Beer, of New York, published a description of the small calibred catheterizing cystoscopes he had devised, and for several years had used, for infants and children, he planted in this country a seed that is now bearing fruit. The American literature on cystoscopic examination of children is small; only about a half-dozen articles have followed Beer's pioneer publication. But these articles are all important and their appearance within the past four years indicates the now growing interest in this sphere of diagnostic and therapeutic effort.

At the last annual session of the American Medical Association, Kretschmer, of Chicago, read before the Section on Diseases of Children a paper on Urologic Surgery in Pediatrics (*J. A. M. A.*, July, 1922) in which he recorded a series of 60 cystoscopic examinations in male and female children ranging in age from 7 months to 14 years. In pediatric urology, he says, ". . . the same diagnostic measures that are employed in the adult can be and should be used; namely, roentgen ray, pyelography, functional tests, blood chemistry, and chemical and bacteriologic studies of the urine as obtained by ureteral catheterization."

Especially significant, and important for the pediatrician to consider, are his statements that: ". . . the various lesions met with in infants and children are not very different from the lesions which occur in the ordinary run of adult urologic cases, with the exception of lesions incident to age, such as malignant tumors of the bladder and prostate and hypertrophy of the prostate," and "The symptoms . . . are similar to those which occur in adult cases, taken at random. Hematuria, a relatively common symptom in adults, is rather uncommon in children; nevertheless, the presence of blood in the urine either grossly or microscopically was recorded in eighteen cases." These corroborate the utterance of Beer eleven years ago: "Post-mortem ex-

(Continued on page 22)

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aminations as well as clinical experience have shown that children are by no means free from diseases of the kidney and bladder but, owing to the lack of a serviceable cystoscope, diagnosis has been lamentably inaccurate." This lack has been supplied, as Kretschmer points out, and he urges that there is no reason for neglecting instrumental examination of the urinary tract of children. Accordingly, he bespeaks close co-operation between pediatrician, general practitioner and urologic surgeon.

At this stage of the development of "pediatric urology" the general surgeon and, especially, the urologist, will appreciate the desirability of equipping himself, in armamentarium and in technical skill, for the cystoscopic examination of children. Certainly, the importance of availability to every pediatric service of a surgeon so equipped has now been amply demonstrated by Beer, Hyman, Hinman, Stevens, Kretschmer and others in this country, as well as by urologists everywhere.—(Am. Jour. Surg., August, 1922.)

The Etiology and Pathogenesis of Pruritus Ani and Anal Pruritus.

Joseph F. Montague, of New York, speaking to the American Proctologic Society, considered that all cases of pruritus of the anus could be clinically divided into two classes. 1. Direct Pruritus of the Anus, due to direct irritation of the peripheral nerve endings in the pruritic zone with consequent primary pathology. The direct nature of this can be demonstrated by the abolition of pruritic sensation by local anesthetization, nerve blocking, or superficial neurotomy. 2. Indirect Pruritus of the Anus, due to the misreference of irritable stimulus from elsewhere to, and conscious perception in the pruritic zone, which at first is devoid of pathology. A desire to scratch is produced, which leads first to a traumatic and then to an infective chronic dermatitis, i. e., a superimposed Direct Pruritus. The early indirect nature of this may be demonstrated by the lack of abolition of pruritic sensation by local anesthetization, etc., and by the discovery of the irritable stimulus. Temporary relief may be obtained by treatment of the direct component, but the indirect component remains and will cause recurrence. On this hypothesis a working basis for treatment may be established. Finally the writer said that he was forced to the conclusion that Direct Pruritus is a distinct clinical entity and Indirect Pruritus a symptom of another disease, and, for differentiation, suggested for the former the name of Pruritus Ani and for the latter the name of Anal Pruritus.

Sympathetic Ophthalmia.

Vail, of Cincinnati, feels that this condition is so insidious and silent in its onset, its progress so steadily onward, and the results of treatment so disappointing in the majority of cases, and the prognosis from the start so bad, that cured cases when encountered should be reported and tabulated. He reports in full two cases in which complete cures were accomplished. To offset criticism of faulty diagnosis, he formulates certain definite clinical findings which he feels must invariably be present to establish a correct diagnosis, as follows:

1. A penetrating injury of one eyeball (which might be an incision for the performance of cataract extraction or iridectomy as well as an accidental injury), followed by a lack of healing response, which is manifested by a quiet iritis with the formation of posterior synechia and absence of severe pain in the injured eye.

2. The presence of systemic anaemia. (This term he uses to express a systemic impression that is invariably present in this disease, characterized by pallor and adynamia.)

3. The appearance in the fellow eye of the following: (these sympathizing symptoms rarely appearing in the second eye before the seventh and usually after the tenth day following the traumatism) (a) Quiet iritis with rapidly forming circular synechia, (b) Plastic optic neuritis and retinitis, and (c) Minus tension.

Case 1. The injured eye was not enucleated until four months after the injury, sympathetic ophthalmia having appeared, diagnosed by the clinical trial together with slight subjective symptoms of transitory attacks of shadows. The treatment in this case in addition to large doses of salicylate of sodium, purging and rest consisted in the administration of salvarsan in 0.15 gram doses, notwithstanding a negative Wassermann. He feels that the arsenic in the salvarsan cured this case by combating the anaemia.

Case 2. Three months after an iridectomy for fulminating glaucoma, sympathetic ophthalmia developed in the other eye. In this case intravenous injections of citrate of iron were given in addition to the salicylate of sodium for a secondary anaemia, with perfect cure as a result.—(Archives of Ophthal., May, 1922.)

Constipation in Young Children

Constipation in older children, says Eric Pritchard, of London, generally due to defective training in earlier infancy and to the abuse of drugs, etc. It sometimes occurs, and for the same reasons, as the result of a previous attack of enteritis, colitis, or dysentery. Violent purges, soap and water enemas, and glycerine suppositories have exactly the same subversive results, while contraventions of the canons of physiological feeding in order to snatch an immediate cure are just as fatal in their ultimate effects as in the case of infants, while the mixed diet provided at this age affords greater opportunity for transgression.

The commonest dietetic resource in the treatment of constipation in children is to keep on increasing the total intake of fat by means of butter, cream, bacon-fat, or cod-liver oil until improvement results. If what has been previously stated in connection with fat-constipation is remembered, the wise man will not rely on this method of cure. For the benefit of those who may not know the approximate amount of fat required in the 24 hours by children of different ages, a table of quantities to show the average physiological requirements of fat for different ages is appended. These quantities should not be exceeded.

Average Fat-requirement of Children at different Ages in the 24 hours.

First month	0.7 oz.	Second year	1.5 oz.
Third "	0.8 "	Fifth "	1.6 "
Sixth "	1.1 "	Tenth "	1.7 "
Ninth "	1.2 "	Twelfth "	1.8 "
First year	1.4 "		

There is a popular belief that porridge is a cure for constipation; if it does cure the condition, its virtue as a therapeutic agent is of the same character as that of figs, raspberries, currents, etc., which give relief by irritating the mucous membrane of the bowel in a manner that not only produces an immediate effect, but also not infrequently leads to chronic diarrhoea, or to colitis. As far as dietetic treatment can be depended on to correct the condition, reliance must chiefly be imposed on observance, and not on the breach, of the cardinal rules of physiological feeding, which have reference to quantity, balance, inclusion of all accessory factors and qualities of digestibility, but in addition care must also be taken to supply a considerable quantity of the food in the form of vegetables and fruit, since their cellulose framework, which is quite indigestible and indestructible, fills up space in the bowel and imparts the required stimulus to the neuro-muscular elements so necessary for adequate peristalsis. Cellulose of this kind is practically the only safe food residue which can be depended on to form the basis of a natural stool, all other forms of residue are liable to irritate or undergo toxic decompositions. Fruits such as bananas, which contain a large proportion of cellulose fibres, are often interdicted for children because thread-like residues of cellulose (often mistaken for thread worms) are found in the stools of those who have eaten them. This is a pity, for bananas have great merits both as a food and as regulators of bowels.

As far as the educational regime is concerned, we have in the voluntary co-operation of the child, a useful means at hand for reinforcing and promoting the influence of suggestion and habit. Physical exercises, designed to bring the abdominal muscles into play, are most useful ancillary expedients, and these exercises can be combined with massage and manual manipulation of the colon.—(The Practitioner, July, 1922.)

Vomiting

C. P. La Page, of Manchester, says lavage is of great use in vomiting, and is very easy to perform. It is the simplest matter to pass a rubber catheter, attached to a tube and funnel, into the child's stomach, provided its arms are shut away in a towel. Many infants seem to enjoy the process and if the catheter is smeared with a little lubricant, the baby swallows the end of it and the tube is gently pushed down into the stomach without any anxiety or difficulty. When it reaches the stomach a little of the gastric contents usually appears at the glass window and shows that the tube is in position. It is then easy to wash out the stomach with a weak sodium bicarbonate solution, taking care not to raise the funnel too high. Occasionally mucus blocks the tube, but this can be remedied. Another condition for which lavage is very useful is for the acute irritability of the stomach in the early stages of infective diarrhoea. Sometimes those very acute infective diarrhoea patients, who are vomiting everything and are having very frequent stools, can be made comfortable by washing out the stomach and the bowel, and then giving the starvation diet. Without lavage they may have persistent vomiting. Lavage must, therefore, always be remembered as being one of the best therapeutic measures for soothing an intractable stomach.—(The Practitioner, July, 1922.)

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The American Medical Press

A new monthly journal has appeared under the name of the *American Medical Press*, with Dr. F. H. McMechan, the editor of the *Ohio State Medical Journal*, as editor. The purpose of this publication is to present to the medical profession problems which are confronting it, especially those having to do with the education of physicians and nurses, specializing in medicine, and social and business problems. There is no journal which devotes itself exclusively to these subjects and it would seem that such an organ should receive the support of a considerable percentage of the medical profession.

Dr. McMechan's abilities as an editor are too well known to require further exposition; it is sufficient to say that under his guidance the journal is bound to maintain a very high editorial standing.

The business manager of the *American Medical Press* is Mr. Harvey S. Knox, who was for many years the business manager of the *American Journal of Surgery*. He is widely known in the pharmaceutical field as an active, energetic and exceedingly capable man. The business success of the *American Journal of Surgery* was due in large measure to his enterprise and perseverance, and he carries into his new publication all the qualifications necessary for success.

It is earnestly to be desired that the American profession will support the *American Medical Press*, because it will treat of problems vital to every member of the profession.

Marshall Field Heads Beekman Street Hospital

Marshall Field has been elected chairman of the Board of Directors of the Beekman Street Hospital, Beekman and Water Streets, New York. The institution was formerly the Volunteer Hospital. Mr. Field has been interested in the hospital for some time and recently took a leading part in the work of reorganizing it.

The fifteen business men composing the Board of Directors are: Marshall Field, Chairman; Howard S. Cullinan, President; Edwin C. Benedict, Vice-President; Howard C. Wick, Secretary; Robert L. Smith, Treasurer; Philip De Ronde, Charles A. Lent, Arthur W. Leasby, Edwin S. Marston, George W. Morgan, G. Alexander Orth, Charles H. Sabin, Hon. Alfred Smith, Orville G. Waring and William H. Woodin, Jr.

The Symptomatic Relief of Indigestion

Combinations of digestive agents, to meet the indications whether the cause of the patient's condition be defective amylolysis or defective proteolysis, are carried on the shelves of every drug store. But there is this difference in the etiology of the two forms of indigestion mentioned: First, the bulk of ordinary food is starchy. Second, the peptic glands have plenty of time to furnish the quantity of gastric juice required, whereas the salivary glands act only while the food is in the mouth.

Moreover, starch digestion being the first step in the disintegration of the food, the digestion of proteins waits upon it; defective amylolysis invites defective proteolysis. By reinforcing amylolysis, therefore, in appropriate cases, we favor the perfect digestion of proteins without the use of any outside aid—pepsin or any other.

The vast majority of dyspeptics are simply unable to take care of the starchy foods they eat, and this disability involves, in time, the digestion of proteins also.

A powerful yet harmless starch-digestant is what is needed. Such a preparation, much more powerful than malt extract and more closely allied to ptyalin than to amylopsin, is the diastase marketed by Parke, Davis & Co. under the name of Taka-Diastase. It is very reasonably claimed by the manufacturers that a fair-sized dose of Taka-Diastase, taken with or immediately after the meal, enables the patient to dispose of the starchy elements of the meal so promptly that the proteins, exposed to the action of the gastric juice, are readily digested in their turn, and in many instances it is unnecessary to prescribe pepsin or any other digestive agent than Taka-Diastase alone.

Taka-Diastase is supplied, we understand, in capsules and tablets of $2\frac{1}{2}$ grains each, and also in powder and liquid form. The usual dose is $2\frac{1}{2}$ to 5 grains, or one or two fluid drachms of the liquid, although much larger doses may safely be given. Taka-Diastase seems to be harmless in any quantity.

National Cancer Week

The second National Cancer Week will be conducted November 12-19, 1922, by the local committees of the American Society for the Control of Cancer, in coöperation with all these official and volunteer agencies which gave such notable assistance last year. The Society now has 665 cancer committees, and it is hoped to double this number before November.

In Insomnia and Neuroses

Well-Borne

ADALIN

Efficient

Fulfils the requirements in the milder types, producing sleep closely resembling the normal and reducing nervous excitement.

In sleeplessness and nervousness requiring a more pronounced effect

ADALIN-LUMINAL TABLETS

(*Adalin*, 5 gr. *Luminal*, $\frac{3}{4}$ gr.)

meet the indications, since Luminal in small dose enhances the hypnotic and sedative properties of Adalin, without impairment of safety.

How Supplied: ADALIN: Tablets, 5 gr., tubes of 10 and bottles of 25; Powder in ounces
ADALIN-LUMINAL TABLETS: bottles of 25



Literature on *Luminal* and *Adalin* on request

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for asthenia, low blood-pressure, suboxidation, subnormal temperature, and other conditions requiring "Adrenal Support."

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Chlorylen is applied by inhalation. 20 to 30 drops are placed on cotton or the handkerchief and inhaled through the nostrils until the odor disappears.

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In tablets.

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(Synthetic Aluminum Silicate)

Indications: Hyperchlorhydria, Hypersecretion, Ulcus Ventriculi and Duodeni.

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A white, tasteless, odorless powder.

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VALAMIN

(Amylene-Hydrate Iso-Valeric-Ester)

In capsules.

A sedative and soporific, easily absorbed and promptly acting.

Indications: Neuroasthenia, Nervous Insomnia, Hysteria, Palpitation of the Heart, etc.

Dose: As a Sedative one to two capsules, as a Hypnotic two to four capsules followed by a drink of water. In nervous insomnia two to four capsules should be taken before retiring.

For further information and literature address

KIRBACH, INC. General Agents 227-229 Fulton St., N. Y.

The Treatment of Inflammation

Not every physician realizes that accompanying, or at the bottom of, almost every pathological condition that he is called upon to treat, lies the element of local inflammation. The phenomena to which has been given the term "local inflammation" are well known to every medical man. Unfortunately, however, few doctors realize that the pathology of local inflammation has to do with certain electrical influences and actions. As a matter of fact, the electro-pathology of local inflammation is just beginning to receive attention. In the treatment of this condition, which means the treatment of many ailments which flesh is heir to, local and even constitutional administration of drugs has proved disappointing. In sharp contrast to the slow and uncertain results obtained from such methods, stands out clearly cut the prompt, persistent and pronounced action and effect of Dionol.

Dionol is drugless; it does not act according to any theory having to do with drug action. It does act in accordance with certain well defined laws governing the production, aggravation and maintenance of local inflammation. It is to be admitted, possibly, that to many physicians the idea of applying Dionol to the surface of the body, over the seat of the underlying local inflammation, does not promise either rapid or pronounced results. Yet clinically, such action is the simplest thing in the world to demonstrate. A clinical test of Dionol is easy to make. The beneficial results obtainable from the use of Dionol are in such cases not to be ignored or discredited. It is a case of "The proof of the pudding"—all that is necessary for any physician to do is to send a request to the Dionol Company, Detroit, Michigan, for sample, literature, case reports, etc. These will be promptly sent gratis and every opportunity given to the doctor to satisfy himself that the claims made on behalf of Dionol can be easily and convincingly made good.

Some Uses of Alkalol

It is to be regretted that the average doctor does not devote more time to a study of the histology as well as the pathology of mucous membranes, because in such event he would realize to a greater extent than he usually does realize, several facts which would enable him to get better results from his treatment of irritation or inflammation of these structures. A mucous mem-

brane implies that it is a secreting membrane, that the secretion poured out by its cells form, when in normal condition, the best antiseptic solution that can possibly be used on that particular mucous membrane. Irritation or inflammation arises either in a suppression or deficiency of such secretion or a hypersecretion, or catarrh. In either event, the mucous membrane suffers. In the treatment of such conditions the first indication is, naturally, to clean off the mucous surface by using something that will not overstimulate the cells and further irritate them.

There are many agents that can be employed for that purpose, the best of which is, as there is every reason to assume, Irragol. This done, however, there remains the most important part of the treatment, a part which is commonly neglected, or omitted by many physicians. The mucous membrane cells when irritated or inflamed are unable to elaborate the normal constituents of their secretion. They become depleted of a certain physiological salts. They either become lazy or over-active. Their blood supply is altered and, in the majority of cases, the tissues surrounding them becomes relaxed or loses tone. The ordinary antiseptic solution does not remedy these difficulties. It cleanses, and in more than one instance, makes matters worse because it overstimulates or even irritates. On the other hand, Alkalol meets the various indications present because it was conceived and worked out to accomplish certain definite actions and effects. Chief among these is the fact that it feeds the depleted cell with salts to help itself to get back to its normal secretory function. Its alkalinity has been carefully adjusted and its proper salinity worked out so that the solution as used does not overstimulate or unduly deplete. Its specific gravity is purposely made hypotonic in order to reverse abnormal, osmotic outflow. In addition to which, Alkalol is soothing and healing to a degree and produces what is best known as a "freshening" action and effect upon mucous membranes.

A great many physicians use Alkalol and continue to use Alkalol in spite of every effort made to introduce other products. The physician who has not used Alkalol owes it to his patients, as well as to himself, to test this preparation clinically, for just as "The proof of the pudding lies in the eating thereof," so the action and advantages of Alkalol can be easily demonstrated by any physician who will take the trouble to make the test.

A request to the Alkalol Company, Taunton, Mass., will bring a sample of this product, together with interesting literature, etc. Write for it.

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Age of Specialism

It has been said, and with a great deal of truth, that this is the age of specialism. Specialism in medicine includes the preparations of a number of therapeutic agents, especially those whose character is such as to demand particular attention in preparation. Therapeutic agents of this class are generally referred to as pharmaceutical specialties, in the manufacture of which The Drug Products Co., Inc., has achieved signal success.

While the policy of this firm is based upon conservatism, every attempt is made to keep abreast of the scientific trend of the times. Consequently, this firm has for some time manufactured a particularly effective list of Endocrin and Gonad substances. In the preparation of such therapeutic agents extreme care and constant vigilance is necessary. The raw material must be carefully selected and each step in the intricate processes of manufacture must be carefully selected and each step in the intricate processes of manufacture must be thoroughly and carefully conducted.

D. P. Co.'s Endocrin and Gonad substances are supplied only in gelatin capsules. Their purity, stability and therapeutic activity are guaranteed. Of quite as much interest to the practical physician is the fact that the price at which these preparations are sold is considerably lower than other preparations of the same quality, which is important because physicians find it a common experience that many patients complain bitterly of the cost of the agents prescribed. The Drug Products Co., Inc., have recently prepared an epitome of this line of therapeutic products which will be sent free to any physician on request.

Schick Test

Preventive medicine, in the concrete, in the full flowering of its usefulness, is dependent upon the general practitioner. His is the force which will make progress, for it is he who stands in the close relationship of respected counsellor and friend to the great mass of people.

If he is, as Sir Napier Burnett has said, "the keystone of preventive medicine," he has a moral obligation. The methods which he advocates for use should always support and add strength to the contentions of medical science. The products employed should uniformly give results which will uphold his professional honor, his personal integrity and good judgment. This is especially true of the specific products prepared for the prevention and relief of infectious diseases.

Of immediate interest are smallpox vaccine virus, diphtheria antitoxin and the newer diphtheria preventive measures, the Schick test and toxin-antitoxin mixture.

Smallpox Vaccine Virus and Diphtheria Antitoxin need no brief. The use of the Schick Test and Toxin-Antitoxin Mixture has passed all stages of experiment. There remains only the education of the parents to their value and great need, the turning of wilful as well as helpless ignorance into knowledge and the fruits thereof—their universal application.

Products which are said to fulfil the requirements of the most exacting physician as regards their quality and dependability and the convenience of the package and administration are those manufactured by Eli Lilly & Company. Schick Test and Diphtheria Toxin-Antitoxin Mixture, Lilly, uphold and sustain admirably the reputation of this house for unexcelled biologics. Another advantage especially in epidemic conditions is their method of distribution which provides ready service through the druggist.

Address Eli Lilly & Company, Indianapolis, Ind., for booklet on Schick Test and Diphtheria Antitoxin Mixture.

The Wassermann Reaction

Martelli draws attention to the different results obtained by careful, conscientious workers in supplying this test, probably due to the qualities of the lipoids and globulins of the antigen and serum used. The way to avoid this discrepancy, he states, is to use various antigens and take the mean of the reaction obtained. As to the specificity of the reaction, after over 6,000 examinations the author believes it can be safely relied on if carried out with proper care and on the original lines. One ought to pay more attention to the quantity than to the quality of the phenomenon in the Wassermann test.

Other conditions beside syphilis will give the reaction, for example, malaria, but in a minor degree. As to the amount of serum to be used, 0.10 c.c.m. to 0.20 c.c.m. is sufficient, but in doubtful cases it is better to use a larger quantity, 0.40 c.c.m. or 0.5 c.c.m. In latent syphilis a short mercurial or arsenobenzol treatment will often arouse the formation of antibodies, and change the Wassermann reactions from negative to positive. A persistently negative Wassermann with a reactivated serum, if there are no signs and no history of syphilis, may be accepted as definite proof of the absence of that disease.—(Rif. Med., November 19, 1921.)

A Scalping Operation for Abscesses About the Rectum.

Walter A. Fansler, of Minneapolis, Minn., told the American Proctologic Society that thorough drainage is recognized as a fundamental principle and the best treatment for ischio-rectal abscess, and that he did not wish to controvert this, but to offer a method whereby the principle might be more thoroughly carried out. The usual T or crucial incisions are prone to close together too soon, but his more radical procedure insures drainage as long as desired. He makes the crucial incision, explores the abscess cavity, and then excises the flaps of skin made by the cross. This leaves a circular opening larger than the size of the abscess, and makes a cavity of the general shape of a truncated cone, which can be easily cleansed and granulated from the bottom. The writer believes that this method will cure with one operation a larger percentage of cases than will the usual methods.

Pyelonephritis

Pyelonephritis is most often emphasized by bladder disturbances alone, but it may be associated with pain abdominal in type, and when associated with acute infection may be extremely difficult to differentiate from urinary infection associated with appendicitis. Not all cases of pyelonephritis show pus in the urine. Direct slide smears are of more value than cultures. There are infections of the urinary tract other than tuberculosis which, in the absence of urinary antiseptics, will not grow on ordinary media. It is not one of the functions of the kidney to excrete bacteria, and the finding of bacteria in kidney urine is evidence of a pathological process in that kidney. Chronic nephritis associated with infection of the kidney is not uncommon. The presence of large amounts of albumen in these cases has in some instances led to exhaustive studies of other portions of the body for foci of infection with total neglect of the kidney itself as a focus of infection.—(*California State Jour. Med.*, May, 1922.)

A Method for Charting Proctologic Cases.

Collier F. Martin, of Philadelphia, described to the American Proctologic Society the method of charting, which he uses in his cases and instruction of students. His diagram consists of three concentric circles, respectively, 2½, 1½ and ¾ inches in diameter. The outer represents the lower cutaneous border of the anus, the middle the ano-rectal line, and the inner the recto-sigmoidal junction. Recently a dotted circle has been added just internal to the ano-rectal line, the space between representing the hemorrhoidal area. Four quadrants are designated by the letters, R, A, L, and P, meaning right, anterior, left and posterior; but, no radiating lines are drawn, as in the Jackson chart, of which this is a modification, since they are found to be confusing. The diagram is large enough to give ample space between the lines to note various pathologic lesions in their appropriate areas by means of certain arbitrary signs, these being so significant that they are easily remembered by the student. This form is printed on the general history chart to expedite the taking of records. Smaller sheets of paper with the same diagram are given to the students during the clinical hour, so that they may record any treatment or additional pathology, and are returned with the history chart, so that any necessary information may be recorded. A rubber stamp also is used with the same diagram, so that old history charts can be brought up to date and additional notes made.

Tuberculosis and War Gasses

Much sentiment has developed regarding the effect of war gasses as the cause of subsequent tuberculosis among service men. The press and public alike hold that their being "gassed" was equivalent to dooming these soldiers to a final fatal tuberculosis. In the examination of some 2,000 service men for compensation we never felt that exposure to "gas" in any way affected the onset or progress of tuberculosis. Neither was it considered as having induced the infection. We have rather been of the opinion that the subsequent post service life of the soldier, habits and environment played a more important and true factor in the activity of the disease.

There has recently appeared a report upon the subject by Lieut. Col. H. L. Gilchrist, of the Medical Corps of the Army. It is the result of over a year's study and investigation of the subject, during which time every known means was adopted to obtain information on the subject.

The conclusions reached from that study are as follows:

1—As to the incidence of pulmonary tuberculosis resulting from exposure to gas, it would seem that it is far from convincing that gas played any particular role in this connection, and it is doubtful if the incidence of lung tuberculosis among ex-service men is much greater by reason of the part that gas played.

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A remedy for all forms of Dyspepsia and Disorders of the Liver and Bile Tract

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2—Those who claim to have developed tuberculosis a year after leaving the service, from conditions experienced in the Army, certainly have no basis for such assertion. They probably would have become tuberculosis patients even if they had never been in the Army.

3—There are two elements entering into this problem—one neurasthenic, where the men have been gassed, usually very slightly, and believe sincerely that this is a factor in any illness; and, second, mistaken diagnosis in many cases, especially those following influenza, in which instances of unresolved broncho-pneumonia occurred in nodular patches and in which the diagnoses of tuberculosis was frequently based on X-ray plates.

With these findings, together with the opinions of competent interests, based upon their experience in dealing with these cases, let us no longer foster the opinion that "gas" used during the war induced the tuberculosis incident among service men. It is time that the public be set right in the matter.—(*Jour. Mich. Med. Soc.*, August, 1922.)

Lichen Planus in Husband and Wife.

Samuel Feldman says that, although cases of lichen planus in the same family have been reported, no case histories have been found in which a husband and wife both had the disease. Feldman reports lichen planus in husband and wife, the condition making its appearance in the wife some eight months after her husband first noticed symptoms of the disease. It should be noted the husband was first seen eleven months after the onset of the disease, and the wife three months after her symptoms first appeared. There was a striking similarity in the appearance and distribution of the lesions, and in the course of the disease. There was the same preponderance of mouth lesions, and the same comparative freedom from itching in both patients. Ill health could not be an etiologic factor, as both husband and wife had been enjoying good health, and they appeared robust and well nourished. There was no question of neurosis. Family predisposition is not to be considered, because the two patients were not related by blood. They were born in different parts of the world. Intestinal toxemia as cause for the lichen planus in these patients can be excluded. Taking into consideration that they had been living together in conjugal proximity, it seems feasible to suggest the possibility of an infectious etiology.—(*Arch. Dermat. and Syphilol.*, May, 1922.)



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Rockefeller Foundation to Assist League of Nations

The International Health Board of the Rockefeller Foundation has entered into a co-operative arrangement with the health organization of the League of Nations whereby the Board will provide a sum not to exceed \$32,840 a year for a period of five years for the purpose of maintaining an international epidemiological intelligence service. The Board will also provide a sum not to exceed \$60,080 a year for three years to put into effect a scheme for the international exchange of public health personnel to be conducted under the auspices of the health organization of the League.

The health organization of the League of Nations was created by the League in September, 1921. Its principal function at present is to conduct an international epidemiological information service and in general to promote international co-operation in the control of epidemic diseases. Incidentally it will advise the League in matters affecting health and co-operate with the International Labor Organization in promoting industrial hygiene.

Since its establishment the intelligence service has kept all governments informed as to the status of epidemics of typhus, intermittent fever and cholera which have been sweeping westward from the famine stricken regions of Russia. Negotiations among European governments looking to the adoption of sanitary conventions for the control of epidemic diseases have been initiated by the health organization and much progress already made. It has also undertaken to promote the international standardization of vaccines and serums.

For the first time in the history of the world there is an agency for taking steps to control epidemics before they get out of hand. The intelligence service of the League of Na-

tions is of vital importance to the people of all countries. It is expected that by the end of the five-year period for which funds have been provided by the International Health Board the epidemiological intelligence service will have become so efficient and valuable that the various national governments will regard it as indispensable and provide funds for its further maintenance.

The exchange of public health personnel is expected to reinforce the other activities of the health organization by promoting mutual acquaintance, understanding and good-will on which effective international co-operation must be based. Interchange of health officials will be arranged not only for observation but for definite periods of service which will result in actual exchange of experience. The proposed system of exchanges will be put into effect first in Europe and may be extended as opportunity offers to other countries throughout the world.

Wisconsin Supreme Court Bars Out Filled Milk

By legislation and court decisions the people are winning the fight against all so-called "milk compounds". The decision in Wisconsin Supreme Court, July 20, in the new celebrated "Hebe" case brought by the Carnation Milk Products Company and the Hebe Company, upheld the state law forbidding the manufacture and sale of the compounds of skimmed milk and vegetable oil. The Carnation Milk Products Company, plaintiffs in the case, had sought to enjoin J. Q. Emery, dairy and food commissioner, from enforcing the law as against their product known as "Hebe".

This much advertised compound, which the Court found to be similar in taste, odor, appearance, consistency and manner of packing to evaporated milk, has been manufactured by the Carnation Company and sold to its subsidiary, The Hebe Company, for five years. It has been advertised by certain dealers in the newspapers of Wisconsin as "milk" or "compound of milk"; and has been sold by a number of retailers in Wisconsin as "milk" or "evaporated milk".